

**Prevalence of Accidental Project Managers in the Information
Communications Technology Industry**

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Abstract

IT projects continue to fail at an alarming rate. The majority of IT initiatives have a significant impact within organisations due to the integrative nature of IT systems and as a result the cost of this failure is high. The purpose of this research report is to investigate the prevalence of 'accidental project managers' in the ICT industry (employees that have demonstrated technical expertise and been promoted to project management positions without any regard for project manager training and competencies) and examine what effect these untrained project managers have on project performance. A descriptive, quantitative research methodology was employed, and the sample that supported this research was taken from members of the Internet Service Provider's Association and the Project Management Institute of South Africa. The results indicated a positive association between project manager training level and projects being completed within budget, on time, and resulting in an operational system. The results also supported a correlative relationship between project manager training level and overall project outcome. These findings highlight the importance to organisations of investing in project manager training and developing effective recruitment criteria in order to boost IT project success rates.

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Chapter 1 Orientation

1.1 Introduction

IT projects suffer from alarmingly high rates of failure and continue to cost organisations millions of rands in sunk costs. The Standish Group reported in the annual CHAOS report investigating IT project failure rates in the United States in 2004 that only 29% of projects were successful and failed system implementations and budget overruns resulted in a cost of \$55 billion in a single year (Softwaremag.Com, 2004).

A number of developments are occurring in the South African ICT industry that are manifesting in an increasing demand for large scale ICT projects. Projects involve every aspect of organisational development, as companies constantly seek to innovate and adapt to rapidly changing business conditions (Shenhar and Dvir, 2007). The modern customer demands products and services to be delivered faster, at a lower cost and with a higher quality and degree of customisation. As a direct correlation, there has been a growing interest in the use of effective project management techniques (Anantatmula, 2008). The Project Management Institute (PMI), largely recognised as the largest body of project management professionals in the world, was founded to facilitate the growth and development of project management knowledge. The PMI has grown from a membership of 55,000 in 2002 to more than half a million members in 185 countries worldwide (The Project Management Institute, 2011). Locally, South Africa has also been experiencing growth in the project management field and a significant number of project management organisations, such as the Project Management Institute of South Africa (which was founded in 1982 and was the first branch to be chartered outside of America), have been established to actively grow the project management profession in the country (Thomas and Mengel, 2008; The Project Management Institute of South Africa, 2010). The ICT industry has always been a keen adopter of project and team-based principles due to the complex and often unique nature of technology-related undertakings and the large number of stakeholders with diverse interests involved in IT initiatives. Information Technology is a critical factor in business success, and as companies realise the importance of aligning IT with strategic goals, the use of projects and their constructs is likely to increase even further (Reich, 2007;

The Project Management Institute of South Africa, 2010; Steen, 1998). This growth in scope and the resultant increase in exposure to project failure makes it more vital than ever to gain a solid understanding into the drivers behind effective project management within the South African environment in order to increase the likelihood of project success. This study seeks to gain a further understanding of these factors by examining the training and performance levels of project leaders in the South African ICT sector by investigating the prevalence of the 'accidental project manager'. This term has been coined to describe the promotion of technical specialists to project management positions based upon technical expertise in the area of the project under consideration or previous outstanding performance in a non-project management role, with little regard for the specialised skill sets and attributes required for effective management. In the Information Communications Technology sector, examples of these technical specialists are commonly programmers, analysts and systems engineers. The position of project manager is frequently regarded as the natural career progression for these experts in organisations that have not established dual technical and project management career paths for professional development. As a result, projects suffer because they are led by inexperienced project managers, untrained and poorly equipped in project management techniques (Graham and Englund, 2004).

This research report focuses on the training disadvantage suffered by accidental project managers and the resultant effect on ICT project outcome. A quantitative, descriptive methodology was employed through the use of an online questionnaire, targeted at members of the Project Management Institute of South Africa and members of the Internet Service Provider's Association, the largest body of ICT companies in South Africa. The survey gathered information on respondent training levels and performance results for previous projects. These results were then analysed through statistical techniques to establish the effect of a project manager's training level on project outcome. By gaining better understanding into the potential advantages of employing qualified project managers to manage IT projects this study will assist in motivating organisations to ensure they have appropriate selection and training methods in place in order to increase the chance of project success and allow them to accommodate the increasing demand for effective project management in the South African ICT sector.

This chapter provides an overview of the topics covered and methodologies employed in this research study. An introduction to the theory and concepts is provided, followed by a description of the problem. The broad context of the research is established along with the scope of the study and the researcher's assumptions. Finally, an overview of the research report is provided in the final paragraph.

In the next section, the problem statement provides more information on the focus of this research.

1.2 The problem statement

Project management is a complex undertaking, requiring expertise in technical skills and proficiency in formal methodologies and tools as well as an aptitude for dealing with 'softer' people-related issues to ensure a favourable project outcome (Bigelow and Baskerville, 2005; Graham and Englund, 2004). The practice of creating project managers based on past performance and technical expertise and ignoring requirements relating to training and leadership skills is a major cause behind IT project failure (Graham and Englund, 2004).

The South African ICT sector is undergoing several changes, further examined in Chapter 2, that are driving an increasing demand for effective project managers. As a result, organisations are accelerating the development and promotion of project managers leading to the potential of large numbers of inadequately trained accidental project managers in the local industry. This study has two main goals. The first is to investigate the prevalence of accidental project managers by examining project management qualification levels in IT project managers. The second objective is to evaluate what effect these accidental project managers have on project outcome.

In order to accomplish these goals, two research questions were formulated:

Research question 1:

- What is the prevalence of accidental project managers in the Information Communications Technology industry?

Research question 2:

- What effect does the training level of project managers have on the outcome of projects?

In order to answer the second research question, the following hypotheses were formulated:

H1₀ : A correlation does not exist between project managers' training levels and project outcome.

H1_A : A correlation does exist between project managers' training levels and project outcome.

H2₀ : A correlation does not exist between project managers' training levels and completing a project within budget.

H2_A : A correlation does exist between project managers' training levels and completing a project within budget.

H3₀ : A correlation does not exist between project managers' training levels and completing a project on time.

H3_A : A correlation does exist between project managers' training levels and completing a project on time.

H4₀ : A correlation does not exist between project managers' training levels and the project resulting in an operational system.

H4_A : A correlation does exist between project managers' training levels and the project resulting in an operational system.

1.3 The importance of the study

The IT function is critical to business strategy. It drives automation, cost reduction and increases organisational flexibility and response time, all key elements in sustaining competitive advantage in the rapidly changing international business environment and global markets (Thite, 2000). IT projects have become too large and critical to be left in the hands of untrained accidental project managers. As exposure and the consequences of failure increase, project management techniques need to

be formally developed and trained in future project managers and a new career path needs to be identified and supported for aspiring project managers (Bigelow and Baskerville, 2005).

Although there have been several studies examining the contribution of project manager training levels to project success, few have been undertaken in the South African environment, with its unique challenges and diverse cultural workforce. This study will initially aim to identify the proportion of accidental project managers practicing in the South African ICT industry. It will then establish what impact (if any) the poor training levels of these accidental managers have on project outcome. Understanding this link will assist in motivating organisations to consider appropriate criteria when selecting future project managers and prioritising their training and development.

1.4 Scope of the study

Standing, Guilfoyle, Lin & Love (2006) note that IT projects are particularly relevant for studying the effects of alternative approaches to project management for the following reasons:

- IT projects are complex and frequently implemented on a large scale. Their importance to business strategy means that they have a high visibility in the organisation and generate significant interest from a variety of stakeholders throughout the organisation. As a result, IT project managers are particularly subject to conflicting demands from stakeholders, a key cause of failure in many projects. Furthermore, the outcomes of IT projects commonly have an effect on a large number of stakeholders.
- Project turnover is significant as most IT ventures irrespective of size are in the form of projects.
- Measurements of success and failure in IT projects are complex and often subjective. Accurately defining project outcome is one of the major topics in project management literature and is explored further in the literature review in chapter 3.

This study is limited to the field of project management in the South African ICT industry. The specific sample was taken from project managers working for member companies of the Internet Service Provider's Association (ISPA) and the Project Management Institute of South Africa (PMISA). The questionnaire was limited to the respondent's previous three projects with a budget in excess of R50,000 and a timeframe greater than two months.

1.5 Assumptions

The study assumed that only the appropriate respondents (project managers in the ICT industry) answered the questionnaire. Although there has been some attempt to filter out undesirable participants through guidance in the covering letters and the use of specific questions in the survey, it was still possible for respondents from other professions, countries and industries to submit questionnaires. The researcher assumed that the absence of motivation for falsifying information (the questionnaires were anonymous and do not offer any reward for completion) was sufficient to mitigate this risk.

This report also assumed that project managers are able to accurately evaluate the performance of their own projects, and do so without bias. Although the lack of reward or punitive measures should have removed any material incentive to exaggerate answers, it is possible that some accidental project managers by their very nature may be unable to accurately gauge the outcome of their projects. For example, untrained project managers may be unfamiliar with many of the tools employed to measure project results such as budget reviews, project plans and post project reviews.

The study also assumes that the respondent's training level was unchanged during all three of the projects that were specified in the survey.

1.6 Limitations

The sample selected was based on a convenience sample and was not randomly generated due to practical considerations.

The study did not provide for a longitudinal view of each respondents training level or make any attempt to allow respondents to associate a training level with a specific project. This limitation is further discussed in chapter 6.

The definition of accidental project manager for the survey and analysis did not take into account project management experience or behavioural attributes and was based solely on training criteria.

1.7 Chapter outline

The first chapter provided an overview of the study and presents the reader with an indication of the focus of the research. The second chapter sets the context of the study, describes the IT industry in South Africa, discusses factors leading to an increase in growth in project management in the local environment and examines project management theory pertaining to accidental project managers. The third chapter provides a detailed review of relevant literature relating to project performance and project leader characteristics. The fourth chapter describes the methods employed in the research and provides a detailed account of the sample selected and the measuring instrument employed to facilitate this study. Chapter 5 articulates the results of the study and provide a summary of the results of the survey and further analysis into the association between the variables. Finally, chapter 6 presents a discussion of the results, further insight into the implications generated from the research, and recommendations for future studies related to this research.

1.8 Conclusion

As projects become larger in scope and the monetary cost of failure increases, it is critical that businesses understand the factors that contribute to positive project outcomes. This study seeks to enhance that understanding in the South African ICT environment by investigating the correlation between project success factors and project manager training levels. This chapter provided an overview of the research methodology, scope and limitations that will be used in order to study this association. The next chapter will provide more detail on the context of the study by investigating in further detail the South African ICT project environment and its relation to the accidental project manager.

Chapter 2 Background of the Study

2.1 Introduction

The previous chapter provided an outline of the constructs of the research report and highlighted the key issues under investigation. This chapter will explore the context of the study. The first section examines the theory of the accidental project manager - those technical experts that are promoted to project management positions based on past successes without any regard for the skill sets required for project management excellence, representing a significant risk to the projects they lead (Graham and Englund, 2004). The second section of this chapter examines trends in the ICT sector in South Africa. The growth experienced in the ICT industry, a shortage of key skills and the continuing trend towards outsourcing, along with the move towards consolidation and convergence, means that IT projects are becoming larger in scope and complexity. As a result, the field of project management is becoming critical to the ICT sector and effective project managers are in short supply (Shenhar and Dvir, 2007). The skills shortage and high levels of demand are also affecting the characteristics of project managers and the level of expertise in the ICT sector, as many of the best technical employees are being accelerated to project management posts. Not only does this rob the technical field of expertise, but often results in a poor manager unable to lead projects (News24.Com, 2007). The next section examines the factors leading to the increase in untrained project managers in the IT industry.

2.2 The rise of the accidental project manager

The IT field is particularly notorious for pushing technical experts in to the role of project leader without any consideration for the specific characteristics or training required to effectively manage projects. As a result many IT projects fail, or are not implemented to their full potential (Bigelow and Baskerville, 2005). Technical-focused people possess strong scientific aptitudes which often result in a lack of political and organisational awareness, poor interpersonal communication skills, and a strong focus on their field of expertise to the exclusion of the business environment in which they operate. These traits can result in a lack of the leadership and team management skills required to capably oversee projects (Thite, 2000). Ware (1994)

proposes that information technology personnel have traditionally focused too much on training and developing technical skills and have not invested enough time in learning or gaining experience in project management disciplines. As a result, IT companies frequently have a deficit in employees skilled in the 'soft' behavioural abilities such as being effective communicators and possessing strong interpersonal skills as well as the 'hard' project management skills such as knowledge of methodology and best practice tools. Zielinski (2005) notes that this historical emphasis on technical skills for project managers is changing as organisations are becoming more aware of the importance of alternative criteria focusing on interpersonal, political and problem-solving skills in project leaders. Kerzner (1987) stipulates that one of the main differentiating aspects of effective project oriented organisations is that they acknowledge and incorporate the differences between normal management and project leadership in choosing and training their staff and leaders. Thamhain (2004b) argues that effective project managers require high levels of enthusiasm for the projects they are overseeing in order to facilitate a successful outcome. Technical specialists often do not enjoy being in management positions, and are frequently untrained and inexperienced in leadership skills and concepts due to their past focus on a specific technical field (Kleim, 1991). Even for those specialists that are able to excel at management tasks, the project management discipline requires a different skill set to traditional management practices. In a study comparing MBA students to project management students, Jacques, Garger & Thomas (2008) discovered that project management students exhibited a greater aptitude for both people and task oriented characteristics, whereas MBA students portrayed a bias towards purely task oriented skills. Previous specialists also encounter problems distancing themselves from their individual specialities which may result in biased project leadership and a weighted outcome to the detriment of the project. Companies that fail to acknowledge project-related competency requirements in their selection and development criteria run the risk of creating poor project leaders and at the same time losing the technical expertise of experienced staff (News24.Com, 2007). As a result, organisations are disadvantaged on two fronts. Firstly, project failures occur because of insufficient project-related skill sets in newly promoted leaders and organisations run the risk of losing a highly skilled technical specialist and gaining a poorly trained ineffective project manager. Secondly, expert personnel that favour technical job-related aspects over behavioural job-related aspects often become dissatisfied with their new position following

repeated project failures and unfamiliar work demands and leave the organisation (Graham and Englund, 2004; Kappelman, McKeeman & Zhang, 2007).

As the demand for project managers in the South African ICT industry increases, so too will the temptation within organisations to fast track project managers without considering the correct skills and competencies required for effective project leadership. The factors that are leading to this increase in demand are examined below.

2.3 Growth in the ICT industry

South Africa has a well-established ICT industry, worth an estimated R178 billion, and is the twentieth largest consumer of ICT products in the world (SaInfo, 2008). The IT industry experienced over 10% growth from 2009 to 2010 and is expected to grow at an average rate of 7.6% per annum until 2015 and thus fuel the demand for project management skills as the number and complexity of ICT projects increases (Bmi-Techknowledge, 2011). One of the main segments within the ICT industry experiencing significant expansion is the internet access and communications market which, according to BMI-Techknowledge, a leading ICT market analyst firm, is expected to increase steadily throughout the next few years. BMI-Techknowledge estimates the South African broadband market will have a subscriber base of two million users by 2010, resulting in a penetration level of 4% of the population. Considering the country had a penetration rate of just 0.2% in 2005, these figures would indicate a significant rise in the adoption of internet access across South Africa (Bmi-Techknowledge, 2006). This growth is predicted to be fuelled through a strong drive by the local government to bolster broadband penetration to meet development goals and accelerate the liberalisation of the local telecommunications market (News24.Com, 2006).

Managed liberalisation has been one of the most significant developments in the local ICT sector in the past few years. South Africa historically suffered from inflated telecommunications and internet access costs due to a significant lack of competition in the local market as evidenced by the government-enforced monopoly in the form of the incumbent, Telkom. The government has acknowledged that excessively high communication costs are a barrier to the development of the local ICT sector and

economic growth of the country, and accepted that the lack of competition in the industry is a major factor contributing to these costs (Austrade, 2007). A number of significant events have recently occurred that are contributing to open up the local communications market to competition. Telkom's licence exclusivity period has come to an end and a second national operator, Neotel, officially began operations in August 2006. Telkom's monopoly on the SAT-3 international cable system, which is responsible for carrying international internet traffic to South Africa, has long been seen as a significant stranglehold on international access for the country. This monopoly period has recently come to an end, opening up competition for international bandwidth provision for the first time and with it the potential to greatly reduce the cost of internet access for South Africans (Writer, 2008). Several significant growth-related regulatory changes have also been introduced in the past decade. The Department of Communications (DOC) has finally acknowledged the artificially high cost of communications and cited several goals aimed at deregulating and increasing competition in the ICT sector (Department of Communications, 2007). In February 2005 the DOC announced that service providers were legally able to provide voice services and self-provide infrastructure, breaking their reliance on Telkom for certain communication facilities (Bmi-Techknowledge, 2008). The DOC also introduced recent amendments to the ICASA and Electronic Communications Acts which are both targeted at granting the Independent Communications Authority of South Africa (ICASA), the body tasked with regulating the South African telecommunications industry and increasing competition in the sector, greater regulatory powers in the ICT arena. These amendments are aimed at assisting ICASA in controlling and reducing interconnection pricing between service providers (long seen as a barrier to cheaper telecommunication costs), issue licenses to additional service providers, and generally enhance competitive conditions in the ICT market. These new legislative changes and the resulting increase in competition are predicted to help grow the total telecommunications market by over 40% during the next few years (Bmi-Techknowledge, 2008).

An additional growth factor for the local ICT industry is expected to arise from an increase in public sector spending over the next five years due to a number of economic and political drivers (Department of Trade and Industry, 2008). The ICT sector is rated in the top five in South Africa in terms of its contribution to the country's gross domestic product (Austrade, 2007; Department of Trade and

Industry, 2008) and the South African government has recognised and acknowledged the importance of a strong ICT industry for bolstering economic development in the country (Engelbrecht, 2007). This recognition was evidenced in a 2008 report describing Gauteng local government MEC Qedani Mahlanga expounding the virtues and critical nature of broadband penetration in South Africa and the importance of a strong ICT sector in general to aid economic growth and help to alleviate poverty in the country. The minister stipulated that Gauteng would have broadband “everywhere” in the next few years as one of its key developmental targets (Engelbrecht, 2008a). In his State of the Province address in 2007, Gauteng premier Mbhazima Shilowa also expounded the importance of ICT in facilitating economic development. As a result of this governmental prioritisation of ICT growth, public spending is expected to continue to focus on IT related initiatives and thus increase the demand for IT projects and competent project managers (Engelbrecht, 2007).

The South African government has also been placed under considerable pressure to improve upon its historically poor service delivery, a constant criticism of the post-1994 administration. In reacting to these demands, the government has initiated several major ICT projects aimed at integrating various systems and services with the goal of establishing a strong e-government infrastructure which it hopes will facilitate an improvement of services and access to information (Bmi-Techknowledge, 2008). SITA CEO Llewellyn Jones stated that “the funding allocated towards IT-related expenditure reflects the continued importance of IT in enabling government service delivery” (Guest, 2008).

As a result of the above factors, public spending on service-related ICT projects in South Africa is expected to increase at a steady rate over the next few years. According to the National Treasury, national government departments are expected to increase spend on computer services from the 2007/8 fiscal year to the 2008/9 fiscal year by 22%, reaching an estimated total of R4 billion (Guest, 2008). Total public sector ICT spend is projected to increase from R6 billion in 2005/6 to R8 billion in 2010/11 (Bmi-Techknowledge, 2008). State-owned enterprises such as Eskom and the SABC spent R6.6 billion on IT and communications services in the 2007/2008 financial year, and this expenditure is expected to grow at an annual rate of 11.3% up to 2013 (Bmi-Techknowledge, 2010).

The planned increase in government spending and the introduction of managed liberalisation are all driving significant growth in the South African ICT industry which is leading to an increase in the number of large, complex ICT projects undertaken in the country, and a subsequent increase in demand for competent project managers. Another factor contributing to the growing size and complexity of IT projects is market consolidation.

2.4 Market consolidation

The international ICT market has been characterised by hyper competition in the past two decades, fuelled by the increasing dissipation of technology worldwide and the erosion of competitive advantage through falling barriers to intellectual property assimilation and technology secrets. These forces are driving technology-focused companies to consolidate in order to better leverage economies of scale and optimise their use of location-based economies (Hill, 2005; Eileen Leopold and Associates, 2000). Additional changes in the nature of technology - such as the move towards convergence - are further fuelling the business case for consolidation in the ICT sector. The South African ICT market, exposed to international competition and market forces following the reduction of trade barriers after the abolishment of Apartheid in 1994, has been caught up in the same trends (News24.Com, 2006; Bmi-Techknowledge, 2006). Furthermore, customers are increasingly demanding a more service-oriented focus, requiring organisations to more tightly integrate all of the steps in their value chain to make service delivery as efficient and flexible as possible and to facilitate tighter coupling amongst worldwide operations (Maree, 2007). As a result of these economic drivers ICT companies are increasingly coming under pressure to increase their product offerings and provide total product solutions for their clients (Mophatlane, 2008). This pressure has also been felt by ICT initiatives within the South African government following the announcement of plans to more tightly integrate e-government services to improve service delivery and reduce operating costs (Bmi-Techknowledge, 2008). Increased competition in the service provider market fuelled by a historically restrictive regulatory environment limiting differentiation strategies has eroded margins and forced many ICT companies to expand their offerings in order to gain advantages from vertical and horizontal integration and seek methods to leverage their existing technical resources, client

base and infrastructure assets across new markets (Rego, 2007; Bmi-Techknowledge, 2006). An example of this trend can be seen by the move of two of South Africa's largest communications providers, Vodacom (Vodacom, 2007) and Telkom (Weidemann and Vecchiatto, 2005) to enter the Digital television market and offer pay-TV services. Mweb, one of South Africa's largest and oldest internet service providers has also launched converged satellite, internet and telephonic services for the first time (Telegeography, 2007).

Local changes in the South African economic outlook have also been a significant factor in the push towards market consolidation. The majority of South Africa's 12 000 ICT companies are small to medium businesses (SMBs). Infrastructure inefficiencies such as the recent problems of power outages compounded with high interest and inflation rates and the global economic downturn are placing a major strain on SMB resources that do not have the financial reserves and buying power of larger corporations. As a result, many SMBs are on the verge of collapse, and are seen as acquisition targets by larger companies. Many of these smaller companies are being swallowed up by competitors or forced to merge with each other to stay afloat (Engelbrecht, 2008b).

The drive towards consolidation, convergence and single product offerings has contributed to the increasing trend towards larger, more complex ICT projects being undertaken in South Africa, requiring multi-talented project teams with diverse skill sets and driving up the demand for skilled project managers to coordinate these efforts (Eileen Leopold and Associates, 2000). Another factor that is increasing the complexity of IT projects is the growing adoption of IT outsourcing, explored further in the section below.

2.5 Outsourcing

One of the trends characterising the global business environment has been the move towards outsourcing non-core operations (Korrapati, 2009). The increase in popularity of business management concepts such as 'core competencies' and 'sustainable competitive advantage' expounded in the writings of business management gurus such as Michael Porter have encouraged organisations to farm out non-core activities in their value chains and focus on core business activities. The complex nature of the

IT function, the increasing use of standards with the resulting commoditization this brings and the constantly changing technological environment has made ICT a natural target for outsourcing in many firms world-wide (Grant, 2005). The outsourcing of IT efforts is further recognised by many companies as a means to maintain technological flexibility and improve solution implementation time while at the same time reducing costs. The South African business environment is no different, with most organisations either already outsourcing or considering outsourcing IT functions to reduce cost of ownership and increase technological proficiency. IT outsourcing is also seen as a means to enable local companies to maintain focus on the business value of ICT projects and avoid being dragged down by the technology itself (Devane, 2000). The focus on global outsourcing has led to the development of virtual teams, often spread across multiple countries and comprising members with a mixture of different cultural backgrounds. The management challenges introduced in this new collaborative environment is driving a demand for project managers skilled in team leadership capabilities with a high level of cultural intelligence, able to manage communications across different geographies (Anantatmula, 2008; Consultingweb, 2009). The complexities surrounding project management in these team-based environments are examined in more detail in Chapter 3.

As a result of the outsourcing trend, project consolidation is occurring across the industry as solution providers take on the responsibilities of their client's diverse ICT requirements. This consolidation is causing an increase in the complexity, scope and diversity of ICT projects, further driving the demand for competent project managers in the sector (Eileen Leopold and Associates, 2000).

2.6 Total product solutions

The above factors have contributed to an increase in the number of active project-related ventures in the global business environment in the past decade.

Another driver that is increasing the demand for effective project management is the growing requirement of customers for total product solutions. The increasing complexity of IT initiatives and the shrinking time frames required for project implementation means that customers do not have the resources to engage with different product-based companies to fulfil their needs. As a result, solutions

providers are seeking to integrate a multitude of products and diverse skill sets across different functional and divisional boundaries, while at the same time ensuring that their efforts produce a coordinated result that meets customer specifications (Eileen Leopold and Associates, 2000). With the increased spend and focus on ICT set to continue, projects are predicted to become larger and more complex (Anthes, 2008). The only way to facilitate this complex integration is through the use of team-based organisms to leverage diverse expertise, which in turn require the effective use of project management techniques and principles to ensure collaboration and coordination of efforts (Graham and Englund, 2004).

In the midst of this increasing project complexity the local ICT sector is also experiencing a critical skills shortage, detailed in the section below, which is driving up the demand for skilled project leaders.

2.7 ICT skills shortage

The global labour market is facing a general IT skills shortage in the wake of rapid technological advancement and increased global competition. The baby boomer generation is starting to enter retirement, and there is doubt amongst human resourcing experts of the ability of the new workforce to replace the previous generation's management networks and technical experience - key performance considerations for project oriented organisations. Furthermore, IT-focused educational institutions are reporting a noticeable decline in new student admissions, largely spurred on by perceptions following the dot-com bust of IT as a high-risk profession, and concerns that IT jobs are at risk of being outsourced to cheaper technology locations such as India and China. These factors are resulting in an increasing gap in skills supply and demand in the global ICT sector (Paul, 2005; McGee, 2005). Paradoxically, the offshore outsourcing trend that characterised the past decade in IT has fallen out of favour for high level management positions such as project leaders as companies recognise IT as a key strategic asset and seek to bring critical leadership skills back in-house to avoid them growing stale (Harris, 2008).

South Africa's ICT sector is not only impacted by these global trends but is further disadvantaged by a general skills shortage driven by an inadequate educational

system and an exodus of skilled residents in search of better prospects overseas (Eksteen and Salojee, 2004). This “brain drain” of expertise is being further fuelled by a push mechanism in the form of the wave of negativity in the country and compounded by a pull mechanism caused by the general ICT skills shortage world-wide (Du Toit, 2008c). In the ITWeb Salary Survey 2007, a large proportion of respondents currently employed by South African ICT organisations indicated that they would readily accept a job in another country (ITweb, 2007). The Department of Labour estimates that the country needs an additional 38 000 ICT professionals to fill existing skills shortages (Du Toit, 2008b). According to research performed by the University of Cape Town, 43% of ICT firms in Johannesburg are unable to obtain enough skilled employees (News24.Com, 2007) and it is estimated that the ICT sector will continue to be drastically under-supplied at current rates of supply and demand (Burger, 2008). As a result of this shortage, many South African companies are unable to satisfy project staffing demands and economic growth in one of the country’s key sectors is being hampered (Du Toit, 2008b; Eksteen and Salojee, 2004). Project management in particular has been highlighted as one of the most in-demand skills in the global ICT sector (Hoffman, 2008). In a study that examined IT skills in several Fortune 500 companies in the United States, researchers discovered that project management was perceived to be one of the most critical IT skills by respondent companies to maintain competitive advantage (Simon, Kaiser, Beath, Goles & Gallagher, 2007). At the same time, the global ICT skills shortage, felt even more fiercely in South Africa as detailed above, has resulted in a strong deficit of effective project managers (Steen, 1998).

As a consequence of this imbalance between supply and demand in the ICT project management field, local companies are naturally tempted to accelerate the development of technical staff to project management positions without considering the necessary training requirements, thus contributing to the pool of accidental project managers in the industry.

2.8 Conclusion

This chapter explored a number of factors that are contributing to a growth in demand for project managers and the increased risk of untrained project managers in the ICT industry. Despite being inadequate for the job, technical staff and line managers are

being promoted to project manager positions to fill this demand and, as a result, these 'accidental' project managers often battle to delegate tasks or end up basing project decisions on technical criteria (Baca, 2007). The management of projects requires specific skill sets and leadership aptitudes that are unrelated to and indeed commonly conflicting to those competencies required for technical excellence. Accidental project managers frequently lack the required skill sets required for effective project leadership. As a result, both the performance of the project and the project leader are negatively affected.

The South African ICT industry is undergoing a number of significant changes that are contributing to an increased demand for effective project managers. Growing competition resulting from globalisation and the reduction of trade barriers is forcing organisations around the world to enhance competitiveness by increasing efficiency and reducing costs while simultaneously enhancing responsiveness and flexibility to changing market conditions and customer demands (Hacker and Doolen, 2007; Anantatmula, 2008). The use of effective project management principles is critical for organisations to implement the type of organisational changes that are required to remain competitive (Shenhar and Dvir, 2007). Projects enable strategic flexibility and optimise new product development, vital capabilities in the modern shifting business environment (Leban and Zulauf, 2004).

Growth in the local ICT industry is further serving to increase the demand for project managers. This expansion is being driven by a number of factors. Government spend on IT is increasing as service provision becomes a priority and e-government is recognised as an enabler, and market liberalisation is finally becoming a reality as the telecommunications regulator ICASA is given greater powers and the new undersea cable lands in South Africa thereby breaking Telkom's monopolistic hold on the country's international bandwidth.

Against the back drop of this increasing demand, a growing IT skills shortage is boosting the demand for local project managers. Furthermore, the use of outsourcing in the ICT sector as a reaction to increased pressures to optimise operations and focus on core competencies has resulted in larger, more complex technology projects often spanning many organisations and involving the collaboration of global

operations, requiring highly skilled project managers to lead them (Karlsen and Gottschalk, 2006).

This chapter set the context for the study, highlighting some of the issues being faced in the South African ICT sector and describing trends that may increase the number of untrained accidental project managers in the industry as a result of the accelerated demand for effective project managers. The next chapter will review the project management literature relating to project performance criteria with the aim of establishing a framework for benchmarking accidental project manager's efforts against project outcome and examine the literature debate around training levels and attributes required for effective project leaders.

Chapter 3 Literature Review

3.1 Introduction

This chapter reviews the relevant project management literature relating to the successful implementation of projects and presents a synthesis of topics relevant to the research study. The chapter is divided into the following sections: (a) an examination of project performance criteria within the IT industry and an investigation into issues dealing with measuring project success; (b) an analysis of literature relating to the impact that project managers have on project outcome; and (c) a review of popular leadership theories and how they relate to the field of project management.

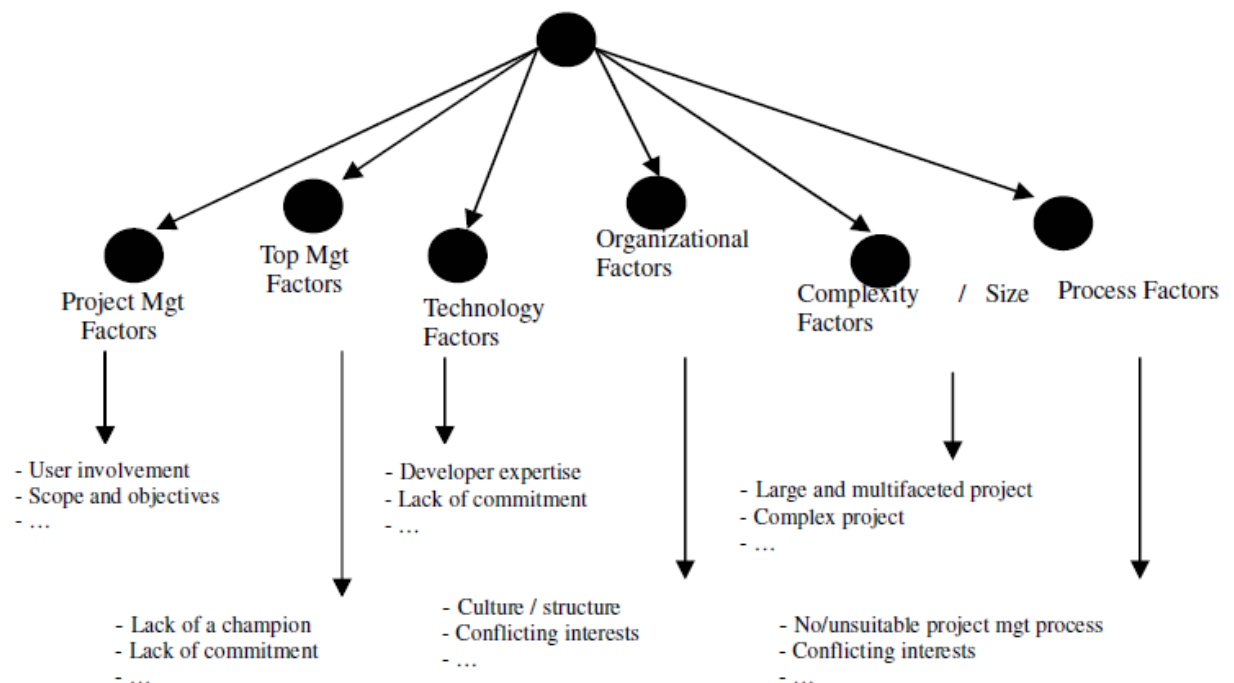
3.2 IT project performance

Despite the growing emphasis in the past decade on effective project management principles and best practice methodologies, IT projects still suffer from notoriously high failure rates (Shenhar and Dvir, 2007). In a survey conducted by Tata Consultancy Services on 800 external IT managers it was revealed that 43% of their senior managers accepted project-related failures as acceptable and expected (Soat, 2007). In 1997 KPMG undertook a study investigating success rates in 176 different IT projects and discovered that 75% of initiatives were late, 61% failed to meet expectations and achieve quality parameters, and 51% came in over budget. The Gartner group conducted a similar investigation in 2000, interviewing over 1,375 respondents, and discovered that 40% of IT projects failed to deliver expected value (Tichy and Bascom, 2008). The Standish Group's annual CHAOS report, which examines the level of IT project success in the United States, is widely regarded as one of the most accurate barometers for IT project statistics. The 2004 Chaos report revealed that only 29% of IT projects succeeded, 53% were either late, over budget, or failed to deliver on required value, and 18% of projects were cancelled completely. Despite these poor performance results Jim Johnson, the chairman of the Standish group, notes that project success rates have improved dramatically since the report was first published in 1994. He attributed this increase in project success to the rise in awareness of the value of project management techniques thus highlighting the importance of project management skills towards improving project performance.

However, considering that the United States spent \$255 billion on IT projects in 2004, the industry lost a staggering estimated \$55 billion on poor project management and IT project failures continue to be widespread and extremely costly (Devane, 2000). The more recent 2009 Standish Group Chaos report revealed that 32% of IT projects completed successfully, 44% were 'challenged' and 24 % of projects were cancelled completely. Although the success and 'challenged' rates have improved since 2004, the failure rate represents the highest level in the past decade. Project performance overall has declined from the group's previous five reports (Standish Newsroom, 2009).

Reasons for external project failures are multi-faceted, stemming from straight forward technical failures to a complex mixture of inadequate processes, poor project management quality, lack of sponsor support, and a poor project environment in the organisation (Al-Ahmad, Al-Fagih, Khanfar, Alsamara, Abuleil & Abu-Salem, 2009). A list of common failures is detailed in figure 3.1 below

Figure 3-1 Common Causes of IT Project Failure



Adapted from: Al-Ahmad, Al-Fagih, Khanfar, Alsamara, Abuleil & Abu-Salem (2009:101)

Many companies simply do not have the project-oriented focus and task maturity required to effectively implement large-scale IT projects. As complexity and scope

continue to increase in projects undertaken in South Africa as described in the second chapter, thereby impacting more areas of the organisation, failures will become more costly and have greater impact on business performance. This complexity makes identifying these failures and quantifying project success and the drivers behind it very challenging and often contentious (Al-Ahmad, *et al.*, 2009). Organisations and researchers encounter great difficulties in accurately measuring project manager performance and project success rates due to the many facets of IT projects (Ojiako, Johansen & Greenwood, 2008). Creating a meaningful comparison and benchmark of different projects is made even more difficult by their unique nature and few studies have investigated the measurement of practical project success factors in the field (Thomas and Fernandez, 2008). The project management industry is relatively young and the dynamic and shifting nature of IT projects makes it difficult for researchers and management scientists to agree a generic performance framework to fit IT processes and initiatives (Al-Ahmad, *et al.*, 2009). Traditional performance management systems that focus on return on investment and profitability criteria often fail to capture the full benefits accruing to the organisation as a result of a project manager's efforts. This complexity is further compounded by the growing trend towards using IT projects to implement organisational change and complex strategic initiatives, undertakings that have long term strategic goals with success criteria that are often difficult to quantify and predict (Chen and Lee, 2007).

This difficulty in measuring project outcome complicates the task of developing an accurate barometer for project manager performance, a challenge that is further compounded by the impact of outside influences. Project outcome is often affected by organisational factors external to the project manager such as the environmental context and degree of project maturity within the company, the attitudes of stakeholders such as clients and senior management, and the characteristics of the project itself (Alam, Gale, Brown & Kidd, 2008). In a research study conducted across 275 large projects in Israel over three years, Zqikael, Levin & Rad (2008) identified six top management support processes that had a significant effect on project success. Of these processes, four were external to the project manager and were present in the organisational environment surrounding the project. Ojiako, *et al.* (2008) also discovered that the quality of external information being fed into a project had a major impact on project manager performance. The quality of this information was found to be greatly influenced by other stakeholders such as the project

sponsor, executive and users. Thus an excellent and highly effective project manager may still be in charge of a failed project if environmental factors are not conducive to project success. Conversely, a poor project manager may still lead a project to successful completion if the external support factors are in place in the project environment (Alam, *et al.*, 2008).

The difficulty in quantifying a project manager's performance level is further compounded by the disagreement in organisations and within the project management literature in defining criteria that should be included as factors for defining project success (Alam, *et al.*, 2008). Many authors propose that the metrics of being within budget, on time, and in compliance with specification requirements should be considered the primary evaluation criteria for appraising project success (Globerson and Zwikael, 2002; Hacker and Doolen, 2007). These three criteria, known as the 'iron triangle', have been the traditional focus of most project management performance studies in the past (Jha and Iyer, 2007). However, many authors in the project management literature are beginning to regard the historical focus on these three measurements as an over simplification of project outcome (Barclay, 2008). Kerzner (1987) adds the criteria that a successful project must also pass a post-project review and must not upset the organisational environment, thus introducing a change management component to measuring project success. He furthermore highlights the general challenges faced in correctly defining project performance criteria, and the resultant difficulties in measuring project success rates within organisations. Ojiako, *et al.* (2008) agrees with this argument and proposes that project success metrics are a complicated set of interrelated constructs which are difficult to define and measure. Following empirical research, Thomas and Fernandez (2008) concluded that organisations that measured *any* project metrics, independent of the specific criteria, enjoyed greater project success than companies that failed to have procedures in place to quantify project outcome, implying a cause and effect relationship between measurement and performance. Barclay (2008) further proposes that evaluating project performance needs to take into account a number of factors outside of the traditional three mentioned above and suggests a project performance scorecard could be used factoring in stakeholder satisfaction, knowledge assimilation, project benefits and project process measurement and efficiency. Shenhar and Dvir (2007) provide two real world examples of project outcome not being in line with the traditional three measurement constructs: the

Iridium Project, developed by Motorola, was a massive technological undertaking that was completed within specification, on time and within budget. However, two years after it was completed it was terminated as a bankrupt failure. In contrast, the construction and development of the Sydney Opera House was consistently behind schedule, experienced constant interruptions, and when eventually completed was delivered more than ten times over budget. However today it is regarded as a huge success, generating tourist revenue and international exposure for the city of Sydney. Jha and Lyer (2007) examined the performance metrics of popular project management literature and grouped the traditional cost, schedule and specifications requirements into 'objective' performance criteria, and added 'safety' and 'dispute' as two additional performance measurement constructs. They further added 'satisfaction of stakeholders' relating to the project team and project clients as additional 'subjective' criteria for project success. This idea of subjective performance measurements is a recurring theme throughout the literature on performance management. Müller and Turner (2007) discovered similar success factors in project performance studies and, following interviews involving various project stakeholders from a variety of industrial sectors, added 'reoccurring business with the client' as an additional criteria to be considered in evaluating project performance (although the practicality of this construct, particularly within the context of internal projects, is questionable). Barclay (2008) expands on the theme of subjective expectations towards project outcome and argues that various stakeholder groups may possess different and sometimes conflicting viewpoints on project success and chronicles a case study involving a project that was delivered behind schedule but produced a working system. The project executive's primary concern was with the timeliness of the project, and considered the initiative an utter failure. The project sponsor, however, viewed the project as a success as the resulting system overcame significant unanticipated internal challenges and was placed into production and operated within required specifications. The sponsor was more tightly involved with the day to day running of the project than the project executive and was therefore more aware of the scale of obstacles the project faced and the hurdles that the project team overcame. The preceding examples illustrate some of the complexity involved in defining project success metrics; project success is a subjective rating, and can be influenced by a myriad of different factors such as the level of stakeholder involvement. For example, clients of a project are usually focused on the achievement of project goals, and are especially concerned with matters of quality

and scope. In contrast, the project team is mainly concerned with the mechanism for delivering the final project objectives (Rad, 2002). These viewpoints diverge because “the former is focused on the deliverables and the latter is focused on the means by which the deliverables are created” (Rad, 2002:2). Often these personal measures of success are unspoken; one of the primary responsibilities of the project manager is to draw out these subjective expectations of project outcome and turn them in to a set of measurable performance indicators (Graham and Englund, 2004).

The literature on project performance contains differing and often conflicting definitions of project success criteria. This lack of synergy, coupled with the subjective rating of success by project stakeholders, makes it challenging to accurately quantify projects as successful or failures (Kolltveit, Karlsen & Gronhaug, 2007). This difficulty has translated into a general lack of definitive empirical studies investigating the impact of specific project manager characteristics on project outcome (Jugdev and Müller, 2005; Edkins, 2007). However, there is general agreement amongst authors that the actions of project managers are a critical factor in determining project success (Graham and Englund, 2004). The next section reviews the literature relating to this key relationship.

3.3 The impact of project managers on project success

Despite the ambiguity in the literature on articulating an accurate definition for project success, qualitative and deductive research has been performed which demonstrates strong links between project manager efforts and project results; many authors have concluded that effective project manager leadership is a critical success factor in technology projects (Prabhakar, 2005; Thite, 1999; Bloom, 1996; Lee-Kelley, Leong & Loong, 2003; Müller and Turner, 2007; Alam, *et al.*, 2008). Top management agree; in interviews conducted by Thite (2000), senior managers unanimously concurred that good project leadership was paramount to ensuring a successful project outcome and reducing the risk of failure. The effective planning of projects, which focuses on resource scheduling and estimating task durations and costs, is critical to the success of projects and requires an accurate definition of responsibilities, processes and roles by the project manager. Failure to correctly identify and secure the required roles and resources for a project would result in a lack of organisational support for project efforts. These planning and definition

activities require a high level of project management skills in order to accurately align resource requirements and capabilities and ensure the achievement of project goals (Anantatmula, 2008). Project managers are tasked with the construction of the project design to ensure that it fits within organisational requirements and aligns with the team structure. Maintenance and monitoring activities by the project manager are also required to ensure that the project structure adapts to accommodate any changes in team or organisational requirements (Cleland, 1995). In an analysis of risk factors impacting project outcome, Kappelman, *et al.* (2007) found that poor project managers were a major cause of project failure. In an empirical study to confirm project manager impact, Jiang, Klein & Chen (2001) interviewed 500 members of the Project Management Institute to investigate project manager effects on projects and found that project manager performance was a strong predictor of successful project outcomes. In a related comprehensive study, Jha and Iyer (2007) attempted to develop a multidimensional view of success and failure factors in projects at various performance levels, and conducted extensive questionnaire and interview-based studies amongst project personnel in order to gain insight into performance influencers. They discovered that 'project manager's competence' had a significant effect on cost, quality and timeliness throughout most performance levels of projects. Although the initial study was based on interrogative techniques which are subject to respondent bias, the researchers validated their results with follow up case study investigations. In a paper discussing factors specific to IT project failure, Tesch, Kloppenborg & Frolick (2007) proposed that effective project management skills are more important to the successful outcome of software development projects than technical expertise. They furthermore acknowledged that the project manager is a key enabler of knowledge transfer amongst project stakeholders and facilitates the coordination and consolidation of project team efforts - a vital component towards project success. As detailed in Chapter 2, organisations are increasingly making use of multi-skilled teams as part of the move towards more project-focused organisations as a reaction to increased competition and the drive to increase flexibility and responsiveness. Companies seek to leverage the potential benefits contained within diverse skill sets that transcend functional, organisational and even national boundaries. The effective use of teams requires a leader skilled in techniques that facilitate the integration and coordination of member knowledge in order to leverage explicit and tacit skill sets (Thamhain, 2004a). Project managers are indispensable in identifying the unique capabilities of their team members,

assigning resources to the most appropriate tasks, and clearly defining and communicating these roles and responsibilities back to the project's team and various stakeholders. These 'management of expectations' activities by the project manager are critical to a successful project outcome (Anantatmula, 2008).

The increasing complexity and scope of IT projects means that the implementation of IT initiatives often requires significant changes throughout the entire organisation. Without a strong project leader skilled in change management techniques, there is a danger that users may naturally resist change and sabotage implementation efforts (Sutterfield, Friday-Stroud & Shivers-Blackwell, 2006). Furthermore, many organisations are realising the benefits of leveraging project-based initiatives in order to implement organisational change efforts (Pollack, 2007). The Association for Project Management states that "Project Management is the most effective way of introducing unique change" (Alam, *et al.*, 2008:224). As highlighted above, projects themselves may be subject to significant degrees of internal change which are often manifested in the form of shifting goals and milestones, schedule alterations, personnel replacements and budgetary realignments. These shifting project attributes may be a result of internal actions and under the control of project participants. For example, the project team may discover previously unidentified obstacles and request schedule adjustments, or the project manager may request new team members if additional technical skills are required for project completion. Changes may also come about as a result of environmental factors that are external to the project such as shifts in the political or economic environment or adjustments in business requirements. New technologies or the resolution of previously unsolved problems may also require a readjustment of project characteristics and priorities (Steffens, Martinsuo & Artto, 2007). Shore (2005), in an article discussing failure in IT projects, notes that organisational change is an integral part of all IS project efforts. He goes on to propose that effective project leadership is crucial in managing this change in order to ensure smooth implementation and a successful outcome. Steffens, *et al.*, (2007) discusses planned project changes, and stipulates that change management requires a careful balancing act. On the one end of the scale all requested changes could be considered and approved to maintain project flexibility and maximise responsiveness to new environmental information, at the cost of introducing constantly shifting milestones and ever-increasing project duration. On the other end of the scale, all change requests could be denied in order to maintain

strict adherence to planned budgetary, schedule and milestone criteria, with the disadvantage that the project may fail due to inflexibility and the inability to respond to external conditions. The authors suggest that successfully leading the project through these extremes and deciding on the right mix of flexibility and goal discipline is the direct responsibility of the project manager. Pollack (2007) agrees with this proposition, and discovered after an analysis of change management literature that many projects now exist within environments subject to a great degree of alteration by external forces. He concluded that strict enforcement of preapproved project plans with respect to dates and milestones may result in project failure and that the negotiation and consultation skills of the project manager are critical in steering projects through necessary change requirements without alienating stakeholders due to shifting deadlines. Resistance to change, and the lack of organisational adaptability, has been identified by several authors as a major cause of IT project failure (Hacker and Doolen, 2007). Other authors have also concluded that successfully managing any organisational change initiatives requires a project leader skilled in change management techniques to ensure stakeholder buy-in and reduce resistance (Devane, 2000; Thomas and Mengel, 2008).

The literature on project outcome acknowledges the relationship between the activities of the project leader and the outcome of the project. But which specific characteristics of the project manager should be developed to ensure a favourable project outcome? The section below provides a review of project management literature relating to the competencies of project managers and how they can influence project success.

3.4 Competencies and characteristics of successful project managers

The Project Management Institute's Project Manager Competency Development framework defines a competency as "a cluster of related knowledge, attitudes, skills, and other personal characteristics that:

- Affects a major part of one's job
- Correlates with performance on the job
- Can be measured against well-accepted standards
- Can be improved via training and development

- Can be broken down into dimensions of competence”

(Project Management Institute, 2007:2)

Certification and formal training in the techniques of project management are important for successful project leaders and readily available. However, the ‘soft’ behavioural skills are just as important and are more challenging to learn and develop. Project managers need to be able to excel at dealing with people, leading teams and navigating the organisational environment. At the same time, good project managers need to have a firm business aptitude and be able to think strategically and analytically, ensuring that the goals of their projects are in line with organisational objectives (Bigelow and Baskerville, 2005). The following paragraphs will examine the unique challenges that project managers face and the characteristics required to overcome them.

One of the many obstacles to effective project performance is reflected in individual project team member’s inabilities to complete deliverables due to a lack of knowledge pertaining to the required tasks, conflicting demands by a direct line manager, or a lack of commitment to project goals (Thamhain, 2004b). In a study on large technology-based corporations in the United States with a minimum turnover of \$100 million, Gemmill and Wilemon (1994) reported that 66% of project managers interviewed had problems with poor team member commitment and involvement in their projects. Thite (1999) found in a related study investigating large projects across eleven organisations that four out of five project managers were unable to effectively implement their projects due to subordinates’ inability to complete the required work or lack of commitment to the project and its goals. As part of an empirical study investigating project performance, Jha and Iyer (2007) examined various influences and inhibitors towards project schedule adherence and discovered that team commitment was the most important predictor to successfully completing tasks on time and within specification. In a subsequent validation of these results, the authors examined several live projects and discovered that three quarters of those projects that had been completed on time exhibited high levels of team commitment. The team members in these successful projects were observed to work long hours and received several team effort awards and accolades from clients complimenting them on commitment levels. Cleland (1995) defines project leadership as “a presence and

a process carried out within an organisational role that assumes responsibility for the needs and rights of those people who choose to follow the leader in accomplishing project results” (Cleland, 1995:86). One of the key points of this definition is the emphasis on *choice*. Project managers frequently have very little formal authority or control over rewards and need to be adept in the people-oriented skills that allow them to influence and motivate their followers to complete tasks without the use of traditional management tools (Kezsbom, 1988). One such influence method that the project manager may employ is the ability to allocate the type of work that team members undertake through the project manager’s formal control over task assignments. To gain more insight into subordinate motivational criteria, Sotiriou and Wittmer (2001) conducted a large-scale research study on 1080 project team members across various industry sectors to investigate the effectiveness of influence methods utilised by several project managers. A significant result of the study was that one of the most powerful motivators and predictors of subordinate performance was the fulfilment of the professional needs of followers; the researchers found that subordinates placed the highest value on challenging and interesting project tasks. The authors concluded that the assignment of work tasks to the appropriate followers was one of the most powerful influence methods available to project leaders to gain team commitment. Thamhain (2004b) discovered similar results, after conducting a longitudinal study over a 4 year period on 27 large technology-based companies in the United States. The results revealed that amongst various popular project performance criteria, fulfilling the professional esteem needs of subordinates were most strongly correlated to project success. These results have extremely important implications for project leaders; the control of tasks is a level of authority afforded to most project managers, and does not rely on formal power over subordinates and therefore can be an important tactic for positively affecting project outcome and overcoming a lack of reward power. In fact, creating challenging project work has been found to be a more important source of power than the more traditional use of reward or punitive power, and is perceived by subordinates as being more effective (Sotiriou and Wittmer, 2001). After examining literature and studies pertaining to project leader power concerns, Kezsbom (1988) found that project managers that relied on positional power were rated as less effective project leaders by followers, and suffered from a lower project success rate. Lee and Bohlen (1997) examined popular influence methods of effective project leaders and discovered that influence strategies relating to direct discipline or threats were the least employed. The authors

cautioned that the results implied that team members may find the sudden use of coercion tactics unexpected and stressful and therefore attempts to increase team performance using transactional reward or punishment actions may have the opposite effect.

The above studies imply that an important characteristic required in project managers for the fulfilment of team members' needs is the ability to assess and identify subordinates' individual attributes, skills and professional requirements. Only with a clear understanding of the needs and capabilities of those being led can a project manager ensure that task and team member assignment are aligned to obtain the best project result. If the project leader has authority over the selection of project members then being able to evaluate potential team staff and match them to the correct project becomes even more important (Thamhain, 2004b). Thus the effective project manager has to possess a high level of interpersonal insight (Kezsbom, 1988). Insight into subordinates is also an important criterion in identifying potential people-oriented conflicts within the leader's team, and anticipating employee problems in advance, an important risk mitigation factor in project performance (Barber and Warn, 2005). Gemmill and Wilemon (1994) found in a study on project leadership that a commonly reported dilemma of leaders was their inability to correctly interpret and diagnose subordinate issues. This lack of understanding ranged from failing to perceive potential conflicts in members to misinterpreting issues that subordinates were attempting to communicate. In a literature synthesis relating to the skill set of project team members, Reich (2007) identifies a 'cultural knowledge' competency which describes an "awareness of the attitudes, norms and behaviours of individual team members". He proposes that this skill is important in a project manager in order to allow her to resolve conflicts and leverage diversity within the team. Gemmill and Wilemon's (1994) research also highlights the importance of conflict resolution as an important project success factor and reported that the second biggest frustration that project leaders faced was the inability to resolve conflicts amongst their teams. Many of the leaders interviewed struggled to overcome interpersonal barriers and establish a team environment conducive to open discussion of issues. Ineffective leaders were unable to appropriately deal with emotionally charged issues and exhibited a tendency towards conflict avoidance, resulting in a reduction in project performance. One of the project manager's roles is

therefore to be aware of the project teams' individual traits, and ensure that they are best managed for the effectiveness of the project.

To assist in the above mentioned conflict resolution efforts and encourage open communication amongst stakeholders, it is important that project leaders obtain team members' trust and respect (Anantatmula, 2008). Trust is a common theme throughout the project performance literature; Sotiriou and Wittmer (2001) investigated further sources of leadership influence in projects, and discovered that a project leader's levels of integrity and expertise were important sources of trust-based influence over team members. When examining the influencing strategies of successful project managers in the United States and the European Union, Lee and Bohlen (1997) discovered that the majority of the respondents interviewed employed a 'rational reasoning' approach coupled with 'consultation' to influence subordinates. This approach is based heavily on obtaining follower trust, which in turn is dependent on the professional integrity and competence of leaders (Yukl, 2006). Thamhain (2004b) also discovered a directly proportional relationship between integrity and positive project performance. Project managers are reliant on rational reasoning methods to influence subordinates, and in order to ensure the effectiveness of this tactic must ensure they have their follower's trust and respect (Lee and Bohlen, 1997). In examining this relationship further, Kezsbom (1988) proposes that if followers exhibit greater levels of trust towards project leaders, they will be more inclined to share issues and report bad news such as potential problems with project goals or conflicts with fellow team members, thus implying that increased follower trust has a positive impact on conflict resolution within a project (Anantatmula, 2008). Grenny, Maxfield & Shimberg (2007) discovered in related research that up to 86% of projects encountered problems due to team members' fear of reporting potential risks and problems. Anticipating problems and possessing accurate knowledge pertaining to project status is a vital component of effective project management, and thus gaining subordinate's trust and respect is an effective tactic for positively affecting project outcomes by supporting proactive issue resolution (Kezsbom, 1988). A common challenge in establishing the required levels of trust and respect lie in the temporary nature of projects. The project manager has little time in which to engage feelings of trust and respect in subordinates and must therefore ensure that she operates with the highest levels of professional integrity in order to maximise team member's perceptions of trustworthiness (Anantatmula, 2008).

As touched on in a previous paragraph, project managers often have little formal control over team selection or discipline, and furthermore are often required to negotiate for team member's time with functional managers (Thite, 1999). This 'authority gap', common to most project environments, is a major source of frustration for many project managers, particularly former technical managers accustomed to traditional line management and established control mechanisms (Sotiriou and Wittmer, 2001) and represents one of the biggest challenges faced by project managers (Vanderluis, 2005). A lack of positional power is often combined with a disproportionate increase in responsibility, thus placing the project leader in a very difficult position (Kerzsbom, 1988). Richmond and Skitmore (2006) concluded after a study on the effects of project management stressors that this mismatch between increased responsibility and reduced formal control over resources was the single biggest stressor amongst the project managers interviewed, indicating that a significant amount of effort and thought is directed at overcoming this obstacle during project management. Results indicated that the most common coping strategies for dealing with these stressors included social support from friends and colleagues, (requiring people and networking skills), the ability to obtain and assign extra resources (requiring negotiation and resourcing skills) and being able to re-organise and leverage greater productivity from project team members (requiring team management skills); these conclusions further highlight the importance of people oriented skills in project managers. The multidivisional spanning of projects means that many members of the project leaders' team will be directly reporting to different line managers in various departments across the organisation and often in different locations around the world. Further challenges are introduced with the increasing trend towards IT outsourcing; team members frequently belong to an entirely separate organisation to the project manager and have no organisational loyalty or shared corporate culture and vision. This outsourced structure introduces unique difficulties for the project manager in influencing subordinates to accomplish project goals and achieve a common effort towards project success (Donnelly and Kerzsbom, 1994).

As evidenced above, project leaders are often faced with the obstacle of requiring access to resources that may reside in other departments or external organisations that are beyond their direct control. A lot of the criteria that influence project success

deal with factors external to the project environment and over which the project leader has little influence (Thamhain, 2004b). So how does the project manager overcome this paradox? Exploring project workers' viewpoints on the importance of project leader characteristics, Donnelly and Kerzsbom (1994) conducted an investigation focused on projects with a medium to high technology component in order to ascertain effective methods to overcome the authority gap. The research subjects indicated that organisational awareness and the leveraging of political skill were significant contributors to effective project management and important attributes for overcoming a lack of potential authority. The authors further highlight the importance of being aware of the prevailing corporate culture and organisational context in order to ensure a correct fit with project efforts. Indeed, effective project leaders are not only aware of the demands of the environment in which they manage projects, but are able to adapt their leadership style as necessary in order to ensure the best fit with the context in which they operate (Anantatmula, 2008). In order to facilitate the required levels of collaboration and integration needed for a successful project in such a multi-faceted environment, the project manager has to become skilled in negotiation tactics and maintain strong political connections and a high level of organisational intelligence in order to maintain awareness of the power structures that exist throughout both the internal and external environment (Kerzsbom, 1988). It is the responsibility of the project manager to influence external factors through organisational contacts and upper management support, and possess enough political awareness to firstly identify any potential priority conflicts and secondly liaise between top leadership and the concerns of the project to ensure swift resolution of any resource alignment issues (Hacker and Doolen, 2007; Longman, 2005). Reich (2007) identifies the concept of institutional knowledge which describes the tacit knowledge contained within the organisation and its political environment, including the concerns of various project stakeholders. Proficiency in the awareness of this type of knowledge by the project leader is vital to the team in order to gain upper management support, and ensure that the characteristics of the project are not in violation of an existing organisational culture which may result in increased resistance to any change initiated by the project. In an empirical study to examine the early warning signs of IT project failure, Kappelman, *et al.* (2007) found that the highest rated risk factor to success was a lack of top management support. The Standish Group publishes a list of top 10 project success factors, and found "executive support" to be the biggest factor for project success, and the biggest

determinant of project failure (Johnson, Boucher, Connors & Robinson, 2001). The ongoing support of senior management is crucial to project success to ensure that the project obtains the right resources, and that political concerns do not override project priorities. It is the project manager's responsibility to ensure the project receives this support through effective stakeholder management (Artunian, 2005; Cash and Li, 1992).

Expounding on this point, a project manager requires the ability to influence a variety of stakeholders external to the project team and mitigate any negative influences on project success. From above, top management make constant and often conflicting demands and seek more 'bang for their buck' by attempting to introduce additional features or reduce funding. From the middle, line managers contend for project resources and undermine leadership efforts by placing conflicting demands on team members. From below, users resist change and undermine implementation efforts. The management of stakeholders is thus an extremely challenging undertaking and has a direct impact on the outcome of a project; strong stakeholder management skills in a project leader are an essential factor towards attaining project success. Project managers are tasked with understanding both the implied and explicit objectives of each stakeholder, and managing them if they are in conflict with the success of the project (Sutterfield, *et al.*, 2006). One of the project manager's primary stakeholder management tasks is to ensure that all stakeholders are involved in and aware of the relevant aspects of the project by facilitating communication between key personnel and thus managing the coordination and collaboration of the efforts and expectations of the various stakeholder groups (Kodjababian and Petty, 2007; Zielinski, 2005). Poor internal and external coordination of the various project participants has been shown to result in cost overruns as a result of duplicity of work, delays in accomplishing objectives, and frequent rework due to poor specifications management. These inefficiencies have a detrimental effect on the overall success of projects (Jha and Iyer, 2007). Cleland (1995) takes this idea further, stating that the entire success of a project is characterised by the project leader's interactions with stakeholders, and hinges on the ability to lead, motivate and manage the expectations of any stakeholder groups with a real or perceived interest in the project; the manner in which the project's stakeholders are handled will have a significant impact on final project success. Even if a project is technically a failure and does not fulfil all of its stated objectives it may still be considered a success if the

project leader has expertly managed the project's external stakeholders such as customers and upper management. On the contrary, a project outcome that ticks all the required boxes may still be considered a failure if people-related perceptions and expectations were inadequately attended to (Rad, 2002).

A key aspect of effective stakeholder management is the ability to establish achievable project goals. A common manifestation of poor stakeholder communication skills on the part of the project leader is the lack of accurately defined scope (Hacker and Doolen, 2007); the Standish Group found that keeping project scope as small as possible was an important success factor in project outcome (Johnson, *et al.*, 2001). Projects often suffer from a misalignment between senior management expectations and realistic project goals, especially if the project has a weak sponsor. A frequently reoccurring problem that plagues IT projects in particular is the reluctance of top management to become involved in what they regard as technological concerns (Cash and Li, 1992). Grenny, *et al.* (2007) found in a research study investigating project performance that 85% of the projects under examination suffered from unrealistic goal setting brought about as a direct result of the project leader's inability to successfully negotiate with senior management. An additional symptom of these poor negotiation skills is that weak project leaders often succumb to top management attempts to push their own priorities and needs ahead of competing projects to the detriment of the organisation as a whole; the same study revealed that 78% of the projects experiencing senior management attempts to circumvent established schedules suffered performance problems. Conflicting priorities and upper management 'bullying' is a common cause of failure in IT projects as technology initiatives impact most departments in an enterprise and managers often attempt to get their needs accelerated in the project pipeline - IT resources are always in demand. Effective project managers thus require strong negotiation skills and political awareness in order to avoid being bulldozed by senior management (Artunian, 2005). Hartman and Ashrafi (2002) conducted a study on 36 various project stakeholders across 12 large projects in Canada, and correlated their results with other research projects. They found that one of the major challenges experienced in project implementation was aligning stakeholders' expectations and key success factor requirements with project goals. This misalignment hampered efforts to accurately measure deliverables during the course of the project, and was a major cause of frustration and failure. In correlating the results of their study, the

authors recommend that in order to better align project success factors and stakeholders' business requirements, project managers must play a pivotal role in ensuring effective communication between all interested parties throughout the life cycle of the project and be skilled in expectations management. Grant, Cashman & Christensen (2006) discovered in an investigation into the root cause of time overruns that the establishment of unrealistic schedules was the strongest predictor of project delay and concluded that the project manager is directly responsible for ensuring from the outset that realistic timelines are in place through the use of effective planning techniques. In order to bridge the gap between project capabilities and stakeholder expectations, the project manager has to be able to negotiate achievable project timelines and deliverables with stakeholders and successfully manage unrealistic demands and expectations. The project manager is instrumental in gathering and documenting stakeholder requirements and success criteria and communicating these in an easy to understand manner to project participants (Al-Ahmad, *et al.*, 2009).

The above interpersonal challenges highlight the need for project managers to possess strong competencies in building relationships and networks amongst various stakeholders. As part of the professional esteem needs mentioned in the preceding paragraphs in the context of motivating subordinates, recognition for work is a primary motivator for followers and an important construct to fulfilling team members' needs. In order to facilitate this recognition for subordinates, effective project leaders need to possess the ability to communicate team members' achievements through established networks. By the same token, gaining respect through the demonstration of expertise requires that the project manager effectively communicate her competencies and achievements through these same interpersonal networks (Kezsbom, 1988). Donnelly and Kerzsbom (1994) concluded as part of their research that the ability to form alliances and maintain relationships is a critical factor in obtaining the necessary collaboration and coordination required to overcome a lack of positional power and facilitate successful project efforts. Anantatmula (2008) discovered in research investigating competencies of successful project managers that possessing strong interpersonal relationships was one of the most important criteria for ensuring project success when projects deviated from planned schedules. A solid network of relationships and a strong competency in stakeholder interaction were found to be the most effective method of ensuring project continuation in the

face of uncertainty and anxiety over unplanned goal deviations. Prabhakar (2005) asserts, after conducting empirical research into the effects of different orientations on project performance, that a relationship-orientation in a project leader is positively correlated with project success.

From the preceding literature synthesis it is apparent that in order to build the required networks, successfully manage stakeholders and establish relationships beneficial to the project, competent project managers require excellent communication skills (Smith, 1999). A common thread in the literature is the proposition that a lack of communication between key stakeholders such as the project team, senior management and customers, is a major cause behind project failure (Graham and Englund, 2004; Jha and Iyer, 2007). Project team members are often distanced from end users and, particularly in the case of IT projects, may be highly specialised technical experts with limited interpersonal skills and restricted access to clients. This isolation creates the potential danger of end user expectations and requirements being misinterpreted or ignored altogether. IT projects are notorious for failing to align project goals with user requirements, and frequently deliver technology-heavy solutions that fail to meet customer needs (Ingersoll, 2007). Thus the effective project leader must have well developed interpersonal communication skills and furthermore develop communication skills in her followers in order to facilitate the necessary coordination amongst project participants and bridge any communications gaps (Longman, 2005; Steen, 1998). The Standish Group's CHAOS study found that user involvement was the second most important predictor of project success. Even when produced on schedule and within budget, failure to meet user requirements is one of the highest risk factors in project delivery (Johnson, *et al.*, 2001). Project managers need to serve as the critical communications link between customers and the project team, ensuring that client requirements are accurately understood and implemented (Fouquet, 2008). Strong communication skills are also fundamental to gaining the necessary levels of commitment from the project's stakeholders towards achieving a common vision and motivating the various parties to synchronize their efforts and interests towards obtaining a desirable project outcome (Cleland, 1995). In a study of risk factors impacting several large international project initiatives across a variety of cultures, Schmidt, Lyytinen, Keil & Cule (2001) found that the top two risk items were related

to the failure of project managers to gain the required commitment levels in executive management and system users.

The management of successful projects therefore goes beyond technical expertise and tools, and requires the effective incorporation of a number of soft skills. Primary amongst these behavioural traits is a strong emphasis on leadership skills (Keller, 1995; Smith, 1999). Many accidental project managers are unskilled in effective leadership methods, and fail to employ proactive risk mitigation and problem prevention leadership tactics. If leaders do not understand the consequences of their actions in complex project environments they are likely to degrade the performance of their projects (Barber and Warn, 2005). Project leadership creates unique challenges for the leader due to the temporary nature of projects, and the relative lack of formal authority as detailed above (Gehring, 2007). Cleland (1995) identifies several additional challenges that project managers have to overcome above and beyond normal leadership concerns:

- effectively managing and communicating with a range of stakeholder groups with varying and often conflicting interests;
- possessing little if any official control over those in their team they have responsibility for, and having to compete for resources with functional managers armed with formal authority; and
- operating in an ambiguous 'matrix' organisational design, with unclear reporting mechanisms, responsibilities and resourcing priorities.

In this section the various leadership theories and their relation to project management will be reviewed to gain further understanding into the required competency set for effective project managers.

Some of the earliest leadership theories proposed that competent leaders possess certain innate traits. The 'great man' theory, which begun in the 1900s and evolved into the trait school of leadership theorised that the presence of these traits was a predictor of effective leaders, and that leaders must be born with these characteristics – they could not be developed or trained. After several investigative studies revealed little empirical evidence that traits could predict leadership success, these theories were largely abandoned (Yukl, 2006). Gehring (2007), however,

notes that the research providing evidence of the ineffectiveness of trait-based theories was conducted on the general management field, and was never conducted in the specific context of project management. He proposed that, applied to project leaders, the trait school of leadership may be applicable in identifying specific characteristics in people that could predict effective project leaders. Based on this theory, Gehring selected certain competencies from the Project Management Institute's (2002) *PMCD Framework* based on his review of popular project management literature and conducted a study to investigate the existence of these competencies in effective project managers. A correlation was found between specific personality attributes and successful project leadership, thus providing empirical evidence that trait leadership theory is indeed applicable to the project management field. As part of the study, Gehring also found a strong correlation between certain personality types and desirable project management characteristics. This study has important implications to this research paper as it suggests that personality and competency criteria are indeed considerations for project manager selection and that accidental project managers may be at a disadvantage. Gehring did not, however, examine whether the competencies that he identifies as being desirable in project leaders can be developed through appropriate training mechanisms.

One of the greatest criticisms of the trait-based theory of leadership was that contextual factors were not taken into consideration when evaluating leader performance (Yukl, 2006). As described in the previous section, project management researchers generally agree that contextual factors external to the project leader such as the characteristics of subordinates, the degree of upper management support and the project and organisational environment have a significant effect on project outcome and must be understood by the effective project manager (Graham and Englund, 2004; Thite, 2000). Thite (1999) conducted a study on IT projects in 36 organisations in Australia, the majority of which were in the ICT sector, to identify the effects of various types of leadership on project success. The results of the research indicated that leadership style must be varied according to the project environment and type of project and that the successful variation of style has a direct impact on project success. The senior IT managers interviewed as part of the study unanimously agreed that matching leadership approach to the situation is one of the most important considerations in project performance. Shore (2005) concurred that

matching the right leadership style to each phase of a project is important to ensure project success. Lee and Bohlen (1997) conducted a study to examine influencing strategies of successful project managers. They concluded that the type of interpersonal skill required to manage different stakeholders varied, and that the contextual-based competencies of project managers relating to interpersonal skills had a significant impact on a successful project outcome. In order to incorporate these contextual concerns into the study of project management, Turner and Müller (2005) propose that the recently formulated competency school of leadership is more appropriate for predicting effective project leaders as it incorporates contextual factors into leadership studies. Competency theorists also propose another important difference from the trait-based leadership school - namely that desired leadership competencies and skills can be *developed* and thus that effective project leaders may be trained (Turner and Müller, 2005). The significance of competency leadership theories to this study is the implication that project managers must be aware of the different styles of leadership and possess the ability to judge contextual factors and correctly apply the appropriate approach to the project under consideration. These abilities can and should be developed in prospective project managers.

One of the prominent leadership schools in the project management literature centres around the full range leadership model. This model consolidates the transformational and transactional leadership theories, first proposed by Burns (1978) and describes the behaviours and effects a leader may use to influence subordinates to inspire and motivate followers to achieve extraordinary outcomes. The full range leadership model describes a leader's behaviours along a scale, with transformational leadership at the top and transactional leadership behaviours at the bottom. The model proposes that all leaders exhibit some degree of all of the behaviours on the scale, varying in the effectiveness of each component. The transformational leader aligns the goals of their followers with that of the organisation, appealing to subordinate's higher-order needs, and thus elevating employee effort and satisfaction (Bass, 1998). Transformational leaders also 'transform' their followers, turning them into leaders themselves, and raising their levels of moral awareness. This process of transformation is brought about by the transformational leader's application of four constructs. The first construct, that of 'idealized influence', describes how transformational leaders arouse feelings of admiration and respect in subordinates. Followers feel a strong need to identify with and imitate the leader. Leaders with this

attribute lead by example, and act as a role model for followers. The leader demands high standards, both in terms of moral and task actions, and consistently applies them in his or her behaviour, thus earning follower's respect and adoration. The leader also demonstrates a strong aspiration to consider subordinate's needs above his or hers. The second construct, 'inspirational motivation', was added in a later revision of transformational leadership theory (Yukl, 2006) and describes leadership behaviour relating to communicating an inspiring vision to followers, and providing subordinates with meaning to their efforts and aspirations. Transformational leaders utilising this factor elevate levels of follower enthusiasm by showing belief in goals and portraying an attractive vision for the future results of follower efforts. Leaders portraying this behaviour also provide more meaningful and challenging work for their followers. Successful project leaders make extensive use of the 'idealised influence' and 'inspirational motivation' tactics, not only in describing a vision, but in convincing others to aspire to achieve this vision. This not only relates to team members, but extends to all project stakeholders including upper management and customers. In order to accomplish this portrayal of a shared goal, project managers need excellent communication and inter-personal persuasion skills (Cleland, 1995). The third construct, 'intellectual stimulation', models how transformational leaders employing this behavioural component bolster subordinate's interests in the problems at hand by encouraging followers to tackle existing challenges from different angles and perspectives. Leaders place a strong emphasis on listening to and examining individual suggestions, and refrain from criticising follower mistakes. Followers are encouraged to challenge existing beliefs and assumptions and employ creativity and lateral thinking when engaging in problem solving tasks (Avolio and Bass, 2002). As discussed in the previous paragraphs, effective project leaders leverage this construct when motivating team members through the delegation of interesting tasks. Finally, 'individualised consideration' describes how leaders view each follower's developmental requirements as unique. Leaders assign specific tasks to subordinates based on their individual skills and potential. The leader also adopts a mentor role, monitoring individual's progress, and applying customized coaching behaviour depending on each subordinate's strengths and weaknesses. Thus the leader adopts an individualised approach to each follower, and views each subordinate with his or her own attributes and reacts accordingly. A full duplex communication system is encouraged for each follower and the leader notes and keeps each individuals feedback separate and distinct (Avolio and Bass, 2002).

Transactional leadership, in contrast to transformational leadership, is based on an exchange between leader and follower. The leader offers rewards or punitive actions depending on subordinate performance. Transactional leadership has been shown to be less effective than transformational leadership, and results in only minimal increases in employee commitment and performance. Due to the limited interaction between employers and employees in a transactional environment, leaders are unable to enhance relationships with subordinates or encourage feelings of loyalty and enthusiasm that go beyond economic exchanges. Transactional leaders have also been found to have slightly negative effects on the quality of leader-member exchanges, and were unable to establish solid relationships with subordinates built on trust and loyalty. This effect is more enhanced between highly educated professionals and their leaders as better educated individuals are less likely to be satisfied with simple recognition for their efforts, and desire greater intellectual stimulation and task fulfilment (Yukl, 2006). Transactional leadership comprises a number of components (Avolio and Bass, 2002). The first is the use of contingent reward, whereby the leader clarifies the required tasks to be completed, and specifies the rewards that will be handed over to followers on successful assignment completion. The leader thus employs an incentive system to obtain follower cooperation. This type of leadership behaviour has been found to result in acceptable success, largely dependent on the degree of leader control over desired subordinate rewards. The second transactive construct emphasizes corrective action by leaders. Two different behaviours have been identified. The first behaviour, active management by exception, describes a transactional leader's active monitoring of subordinate performance. If follower behaviour deviates from desired task specification, leaders will proactively intervene to perform any necessary corrections. This is the more effective of the two behaviours associated with management by exception. The least effective, passive management by exception, results in a leader intervening in unacceptable follower behaviour and performance only after mistakes have occurred. The last component of the full range leadership model, that termed 'Laissez-Faire' leadership, is regarded as the least effective leadership behaviour, and essentially describes an absence of leadership (Avolio and Bass, 2002).

In response to the difficult demands of complicated project environments and the need to motivate team participants, incorporate diverse stakeholder interests, pre-

empt problems and create innovative solutions to interpersonal and technical issues, many authors propose that transformational leadership behaviours are a natural complement for the effective project manager (Barber and Warn, 2005; Thite, 2000). A significant amount of research studies have demonstrated that the use of transformational leadership behaviours in project managers have a positive impact on project performance (Leban and Zulauf, 2004; Thite, 2000). In Thite's (2000) study on the effects of transformational leadership, leaders of successful projects portrayed a management style in line with transformational leadership attributes. Leaders of less successful project teams exhibited reduced transformational characteristics and showed a tendency towards transactional leadership behaviours. In particular, the transformational traits of intellectual stimulation and charisma / articulating a vision were found to have a particularly strong influence on project success. The transactional construct of contingent reward was also found to be important in motivating followers to achieve high levels of project task performance. The use of the negative management-by-exception trait was also measured, and found to be negatively correlated with management success. Prabhakar (2005) conducted a 2-phase questionnaire based study on a combined sample of 153 project managers across 28 countries to examine various leadership correlations in the project management field. He examined the four individual components of transformational leadership as mentioned above, and discovered that each one was a strong predictor of project success. Janis (2004) performed similar research, examining the relationships between the full range leadership model factors and the project performance criteria of team member job satisfaction, perceptions of leader effectiveness, and extra subordinate effort. Study results revealed that a transformational leadership style in project managers had a strong positive impact on the perceived effectiveness of project managers. His research results also revealed a positive effect on individual subordinates in that team members experienced more job satisfaction with a transformational leader and were prepared to exert more effort. The author also discovered a small positive association between the transactional leadership construct of contingent reward and subordinate effort, and a negative relationship between laissez-faire leadership and all three of the examined variables. The study concluded that projects managed by leaders displaying behaviours correlating to transformational leadership factors exhibited greater performance.

The above literature review on transformational leadership theories indicates that the employment of transformational behaviours and to a lesser extent transactional constructs have a directly proportional influence on project success, and that project managers should therefore be selected and developed in order to bring out these qualities. However, Keegan and Hartog (2004) note some caveats in applying transformational leadership theories to the field of project management. The nature of the project environment can often constrain the effectiveness of transformational leadership. For example, one of the key transformational tools - that of follower development - may be inhibited by the project team structure. The temporary nature of projects and the lack of formal authority make it difficult for the project leader to directly influence his or her subordinate's career path. For projects that extend over longer periods of time a paradox may evolve that disadvantages team member's long-term goals; project managers will be in the best position to judge project employees' performance and potential, but at the same time have little control over their career paths. Line managers that do possess the required formal authority will have reduced interaction with their staff and thus be less able to act as mentors and facilitate employee development. Another example of the challenge faced in the project environment is the need to establish a trust relationship between leader and follower for effective transformational leadership. It is more difficult for leaders to obtain this trust in a project setting due to the temporary, often virtual nature of teams and the transient relationships that are often a characteristic of projects (Keegan and Hartog, 2004).

3.5 Conclusion

This chapter presented a synthesis of project management literature relating to the success of projects and the impact that project managers have on project outcome. The section on project performance provided a brief examination of the literature relating to common causes of project success and failure, and examined the issues surrounding the accurate quantification of project success and failure, providing evidence that project outcome is a difficult and subjective concept to define and measure. Project management literature describing the impact of the project manager on project outcome was reviewed, and further analysis revealed that the actions and characteristics of project managers are a significant predictor of project success. The chapter then examined studies to define these characteristics, and it

was discovered that several key inter personal competencies can be identified in successful project managers:

- The ability to manage teams; skilled project managers are able to leverage control over task authority in order to motivate team members. Effective project managers are also able to resolve conflicts within teams.
- Organisational intelligence; effective project managers have a highly developed sense of political awareness and are able to adjust their leadership tactics in accordance with business context.
- Stakeholder management and negotiation skills; the effective project manager is able to influence a variety of stakeholders from team members to upper management in order to control project scope, overcome the authority gap, bolster commitment to the project and negotiate resourcing requirements.

Literature on leadership theories was also examined in the context of project management, and transformational leadership constructs were analysed and contrasted with the components of project leadership.

In conclusion, an examination of the above criteria and literature relating to project success and failure reveals the emergence of two important themes. Firstly, most of the risk factors relating to project failure involve leadership concerns and are directly influenced by the skills and actions of the project manager. Very few of the factors contributing to project implementation problems resulted from a lack of technical domain knowledge issues (Keegan and Hartog, 2004; Thamhain, 2004a; Tichy and Bascom, 2008). In fact, concentrating on technical details such as specific technologies and traditional management tools has been shown to hamper project efforts, as this focus may detract from understanding the important cognitive criteria surrounding successful projects (Gottschalk and Karlsen, 2005).

Secondly, the literature review indicates there are specific skill sets that are desirable in project managers. The science of project management has undergone significant development in the past half century and project theory has become a focal point for greater amounts of research attention with many formal qualifications in the training of project management disciplines being offered through leading business and management institutions. Training in project management techniques is considered

critical for the successful project manager (Shenhar and Dvir, 2007). Many of the stressors placed on the project leader can be alleviated through the correct use of trainable project tools and methodologies such as planning, risk management and resource scheduling (Richmond and Skitmore, 2006). The PMCD incorporates a list of over 200 competencies which are recommended for effective project management grouped into knowledge, performance and personal characteristics. An important implication of the PMCD's definition of competencies is that they can be *developed* in potential leaders (Project Management Institute, 2007). A trained and certified project manager, armed with formal knowledge of the technical tools of project management, is more likely to successfully deliver projects on time, within budget and compliant to stakeholder requirements than an accidental project manager who has had little or no project management training (Bigelow and Baskerville, 2005). The Standish Groups' CHAOS report found that using a formal, trained project methodology will increase project success rates by 16% (Johnson, *et al.*, 2001). Many proponents of the full range leadership model discussed in the previous section maintain that the components of transformational and transaction leadership can be trained and development in potential leaders, thus further motivating the argument for project management training (Leban and Zulauf, 2004). Although there is an on-going debate in the general leadership literature as to whether leadership qualities can be trained or are innate (whether leaders are born or can be made), it is clear from the literature review that many project management tools can be trained and leadership qualities can and should be taken in to account when selecting future project managers. The implication of these findings is that accidental project managers who are promoted based on their technical skills but without consideration for hard or soft project management skills and attributes will be disadvantaged in leading projects and will be more likely to fail. The appropriate selection and training of potential project managers has significant benefits for organisations, and is an important factor in retaining skilled employees, focusing training on the right people and reducing the significant cost of IT project failure (Jacques, *et al.*, 2008).

This research report will seek to gain a better understanding of the current training levels of project managers in the South African ICT industry, and examine what effect these levels have on project outcome. The next chapter provides information on the methodology and instruments used to facilitate this investigation.

Chapter 4 Research Methodology

4.1 Introduction

The goal of this research report is to examine the prevalence of accidental project managers in the ICT industry, and to analyse the association between project manager training levels and project outcome as defined in the research questions and hypotheses. In order to accomplish this goal a quantitative, descriptive research methodology was employed. This chapter provides more detail on this process: the research questions and hypotheses are discussed and the research instrument and sample selection process are described.

4.2 The problem statement

This study will analyse the prevalence of accidental project managers in selected South African ICT companies and examine their effects on project outcome. In order to facilitate the research the following questions were examined:

Research question 1:

- What is the prevalence of accidental project managers in the Information Communications Technology industry?

Research question 2:

- What effect does the training level of project managers have on the outcome of projects?

The following hypotheses were formulated in order to evaluate the effect of project managers' training levels on project outcome:

H1₀ : A correlation does not exist between project managers' training levels and project outcome.

H1_A : A correlation does exist between project managers' training levels and project outcome.

H2₀ : A correlation does not exist between project managers' training levels and completing a project within budget.

H2_A : A correlation does exist between project managers' training levels and completing a project within budget.

H3₀ : A correlation does not exist between project managers' training levels and completing a project on time.

H3_A : A correlation does exist between project managers' training levels and completing a project on time.

H4₀ : A correlation does not exist between project managers' training levels and the project resulting in an operational system.

H4_A : A correlation does exist between project managers' training levels and the project resulting in an operational system.

A Pearson chi-square statistical test was used to evaluate the association of the independent and dependent variables. An alpha of 0.05 was used to reject the null hypothesis. This test was chosen because it is a good tool for analysing ordinal and nominal data dependencies that do not necessarily follow a normal distribution (Leery and Ormrod, 2005).

In order to calculate the Pearson chi-square and level of significance, SPSS Statistics version 18.0 statistical software was used.

4.3 Validity of the study

According to Leery and Ormrod (2005) the internal validity of a study describes the suitability of the data results in allowing the researcher to draw conclusions about the relationship between variables. The internal validity of this study is assisted in the following ways:

1. The questionnaire is conducted with a high level of remoteness between the interviewee and the researcher, thus ensuring that the researcher does not influence the respondents in any way.
2. The participants were not made aware of the researcher's problem or sub-problem questions, the purpose of the study or the relationships being

examined. Thus they could not exhibit any bias towards affecting those relationships.

3. A pilot test was conducted with five project managers. Using an interview process, the researcher ascertained where these project managers fit within the 'accidental project manager' framework. The project manager's questionnaire results confirmed that the questionnaire was indeed measuring the correct constructs.

4.4 The sample

The population is the set of project managers in the ICT industry in South Africa. Within this population, two convenience samples were selected to form a sample frame. The first one consisted of employees from companies that are members of the Internet Service Provider's Association of South Africa (ISPA). This sample was chosen for the following reasons:

1. The researcher had contacts within the ISPA due to a previous business as director of a member company.
2. The ISPA represents the largest group of ICT sector companies in South Africa. Its membership includes the biggest technology providers in the country such as Dimension Data, Internet Solutions, iBurst, Mweb, Datapro and MTN Networks (Isipa, 2009). Combined, these companies employ tens of thousands of highly skilled staff and provide ICT solutions to a multitude of customers.

The researcher contacted Anthony Brooks, head of the ISPA, to facilitate the study. The questionnaire and covering letter were approved by the management committee of the ISPA, and were sent to the primary contacts for each member company in the ISPA member database. These contacts were instructed to circulate the letter and questionnaire link internally.

The second sample was chosen from the Project Management Institute of South Africa (PMISA), which has over 1,300 members. The CEO of the PMISA, Taryn van Olden, agreed to communicate the survey to the PMISA members using the following mechanisms:

1. An article in the electronic PMISA newsletter.

2. An article posted on the PMISA website.
3. An article published in the PMISA magazine.

(See Appendix 2)

4.4.2 Eligibility

The study was targeted specifically at Project Managers within the ICT industry in South Africa. Because the questionnaire was conducted online and due to the nature of the population the researcher was unable to directly verify that all respondents were eligible to complete the study. In light of this, a number of methods were used to increase the chances of recipient eligibility.

- The covering letter clearly highlighted the desired respondent profile.
- The questionnaire contained clear instructions at the top of the page drawing the reader's attention to the eligibility criteria for completing the survey.
- Key questions were placed in the survey to filter out undesirable candidates:
 - a) Question 4: 'Which function best describes your current role'? Only recipients that answered 'Project Manager' were included in the survey.
 - b) Question 5: 'In which industry do you work?' Respondents that selected any industry other than 'Information and Communications Technology (ICT)' had their answers excluded from the results.

A total of 247 recipients successfully completed the survey. Of these respondents, 196 were eligible to participate in the study based on the filtering criteria as described above.

Section 3 of the questionnaire contained questions relating to the performance of 3 previous projects. Each question gave the respondent an opportunity to select 'Don't know' to any of the performance criteria. A project with 'don't know' chosen against any of its performance criteria was excluded from the survey results. The eligible respondents provided information on a total of 588 IT projects. Of these projects, 145 were excluded due to incomplete information, leaving a total sample size of 443 projects.

4.4.3 Sample bias

Research is not conducted in a vacuum and any selected subset is likely to suffer from some degree of sample bias. It is therefore critical that the researcher acknowledges any potential sources of bias that may impact the sample selection and the results of the study (Leery and Ormrod, 2005). The researcher of this report acknowledges that the choice of sampling mechanism introduced the following risks of sample bias:

1. The sample's effectiveness was influenced by the attitude of the 'gatekeeper' at each company – those personnel within each member organisation that are subscribed to receive the ISPA and PMISA mailing list. The willingness of these initial contacts to forward the research request internally will have had an impact on the resultant sample size.
2. Only respondents with internet access were able to complete the questionnaire.
3. The research request was emailed during working hours to the ISPA list and it is therefore likely that respondents' working conditions affected their likelihood of participating in the research. Those with a more liberal internet policy at work would have been more likely to respond to the survey. Those with a more restrictive organisational internet environment, for example one that limits web access or has strict spam blocking criteria, were less likely to complete the questionnaire.
4. In the interests of ensuring that respondents were not afraid to provide honest answers that may implicate their role in project failure, the questionnaire does not request any personal identification information such as name, email addresses or employer. The disadvantage of this tolerance to anonymity is that it opens up the potential for duplicate answers (the same participant may engage in the survey more than once, either maliciously or accidentally).
5. Only English-speaking respondents were able to participate in the online questionnaire.

4.5 The research methodology

This research follows a descriptive, quantitative design. This type of methodology involves describing the current state of a data set using statistical summaries and

making observations about its characteristics and the relationships and trends between highlighted variables. In particular, this study made use of a correlation research model in that the relationship between the prevalence of accidental project managers and project outcome was compared and contrasted (Leery and Ormrod, 2005).

4.6 The research design

To target the ISPA email recipients, an email covering letter was provided along with a link to the online survey (see Appendix 1). The covering letter explained the nature of the survey, the desired demographic of the targeted respondents, and requested that the recipient circulate the email internally.

The ISPA email communication was timed to go out during the working day to avoid being buried in the previous night's email. The text was kept as simple as possible in order to reduce the likelihood of being blocked by spam detectors. The email was also submitted in advance to a professional spam checking site for verification, and received an acceptably low score.

In order to administer the questionnaire targeted at PMISA members a short article was provided to the CEO for publication (see Appendix 2), detailing the nature of the study and providing a short summary of the research. A link to the online questionnaire was provided in the text along with the desired demographic information of the target recipients and a request to forward the information to colleagues involved in the project management industry.

4.7 The research instrument

The study was in the form of a survey research design. This design involves tabulating information from a population through the use of an interrogative instrument and summarising the results (Leery and Ormrod, 2005). In the case of this study, the interrogative instrument was an online questionnaire provided by the website www.surveygizmo.com (see Appendix 3). Several online survey providers were investigated and Survey Gizmo proved to be the most powerful and user friendly. The online questionnaire was located at

<http://www.surveymoz.com/s/162575/project-management> and a copy is attached in the appendix.

The first section of the questionnaire gathered demographic information such as gender, age and educational history. Section 2 of the questionnaire gathered professional background information for filtering out undesirable respondents and gauging training levels, and contained questions relating to the recipient's current role, industry and project management certification. The final section of the survey questioned recipients on the performance of the last three projects they managed by examining time, budget and operational outcomes.

One of the main advantages of an online measuring instrument utilising electronic communications is that it can be quickly deployed to thousands of potential respondents at very little cost using email and web technology. A further advantage is that participants are distanced from the interrogator and therefore there is less likelihood of the respondents being influenced by the researcher (Leery and Ormrod, 2005).

One of the disadvantages of the research method employed is that respondents evaluated their own efforts without any verification or triangulation of results and may be biased towards rating project outcome. However, the distance from the researcher, the anonymity of the study as well as the removal of any material incentive to bolster the individual's results (the research study did not offer any rewards for highly rated project outcomes) helped to mitigate this risk. Another disadvantage of such an approach is that questionnaires traditionally have a poor response rate (Leery and Ormrod, 2005). The researcher overcame this limitation by targeting as many recipients as possible by leveraging the advantages offered in an online communications tool and relying on the content and questionnaire to filter out undesirable respondents. For example, candidates that did not select 'Information and Communications Technology (ICT)' in response to the survey question 'In which industry do you work' were filtered out of the final survey results.

A further shortcoming of the use of a questionnaire-based study is that respondents were unable to seek clarification if any of the questions were confusing or misunderstood. The researcher sought to mitigate this risk by using short, easy to

understand questions. This method should also have assisted in overcoming problems arising from any respondents with poor English language skills, a risk in South Africa's diverse cultural environment.

4.7.1 Questionnaire Reliability and Validity

According to Leery and Ormrod (2005), researchers can enhance the reliability of a measuring instrument by ensuring that it is delivered in a consistent fashion. In order to comply with this requirement the same covering letter and online questionnaire were administered to each participant.

The validity of an instrument describes the degree to which the instrument assesses what it is intended to measure (Leery and Ormrod, 2005). In order to determine the validity of the questionnaire, the online survey was administered to a pilot group consisting of 4 project managers in the IT industry and 1 project manager in the legal field to ensure that the questions were relevant and recorded the intended information. Each pilot member was interviewed by the researcher to attain information required to validate the questionnaire. This included data on individual project management training levels as well as information on the outcomes of previous projects. The project managers were also asked to provide feedback on the quality of the survey and clarity of the questions.

The information obtained from the interview was compared to the results of the pilot study for each individual. It was observed that in each case the questionnaire correctly identified those project managers deemed as 'accidental' managers. Furthermore, the questionnaire accurately recorded the outcome of projects managed by the participants. Finally, the project manager in the legal field was correctly filtered out of the survey results. Suggestions from the interview were collated and incorporated into the questionnaire.

4.8 Data analysis

4.8.1 Definitions:

Accidental project manager

An accidental project manager was defined as a respondent that selected 'no formal project management training' to the question relating to project management certification level.

Project outcome

The Standish Group defines the following project outcome possibilities:

Success. The project meets budgetary and scheduling requirements; the project results in an operational system.

Challenged. The project results in an operational system, but fails to meet either budgetary or scheduling requirements.

Failure. The project does not result in an operational system (irrespective of budgetary or scheduling outcomes).

(Johnson, *et al.*, 2001)

These definitions were used in the research study to classify project outcome. They were mapped to each project in the questionnaire using the logic described in table 4-1.

Table 4-1 Project Outcome Definition

Survey question			Outcome
Project delivered within budget?	Project delivered on time?	Project resulted in an operational system?	
Yes	Yes	Yes	Success
Yes	No	Yes	Challenged
No	Yes	Yes	Challenged
Yes/no	Yes/no	No	Failure

Variables

The independent, ordinal variable was 'project manager training level' that captured three possible values: a) 'never received project management training', b) 'received some project management training' or c) 'certified in project management (PMP, CAPM, Prince 2, etc)'. Four dependent nominal variables were analysed relating to project performance. The first three allowed for yes/no answers. These were: 'within budget', 'on time' and 'resulted in an operational system'. The final dependent variable was 'project outcome', and was calculated from the previous three variables using the logic described in table 4-1.

4.9 Conclusion

In order to examine the prevalence of accidental project managers in the ICT industry and evaluate their effect on project outcome, two research questions were formulated along with a number of hypotheses. A quantitative, descriptive research methodology was employed to investigate the answers to these questions, facilitated by an online questionnaire used to gather research data from two sample groups. The first group consisted of members of The Internet Service Provider's Association and the second group comprised of members of the Project Management Institute of South Africa. The validity of the questionnaire was established by administering it to a pilot group consisting of 5 project managers and cross-referencing their answers against known information established in an interview. This chapter also defined important constructs used in this research report, including the definition of project outcome that will be used to evaluate the success or failure of the projects in the sample. The next chapter will examine the results from the research methods described in this chapter, and provide a summary of the data gathered from the online survey.

Chapter 5 Research Results

5.1 Introduction

The goal of this research study was to determine the proportion of accidental project managers in the ICT industry, defined as project managers without formal training or certification. The study also compared the outcome of projects that were managed by accidental project managers against projects that were managed by trained project managers. To facilitate this comparison the independent variable, namely the training level of the project manager, was examined through the use of specific questions in an online questionnaire relating to project certification. The dependent variable, project outcome, was measured through a series of project success questions through the same online survey.

5 project managers were used to test the validity of the questionnaire. All testers approved the questionnaire subject to a few minor amendments and it was subsequently deployed to two sample groups. The first group consisted of IT companies that are members of the Internet Service Provider's Association and the second group comprised members of the Project Management Institute of South Africa. In order to control scope and ensure that data integrity was maintained, several questions were used to filter out respondents that fell outside of the desired sample range and a cover letter was sent with the mailer highlighting the target group.

This chapter presents the findings from the online questionnaire. Demographic information was collected and summarised such as respondent's age group, educational level and gender. Finally, the research questions are addressed and the results analysed.

5.2 Findings

5.2.1 Demographic information

The online survey captured demographic information from each respondent. This included information relating to gender, age group and education level. Of a total of 196 respondents, 152 (78%) were male and 44 (22%) were female. The survey also gathered educational demographic information. This is summarised in table 5-1 below.

Table 5-1 Education Level by Gender

Education level	Female		Male		Total	
	Count	%	Count	%	Count	%
<i>Undergraduate</i>						
Some high school	0	0%	0	0%	0	0%
High school / diploma	12	6%	32	16%	44	22%
<i>Graduate</i>						
Bachelor's / Honour's	30	15%	110	56%	140	72%
Master's degree	2	1%	10	5%	12	6%
Doctorate degree	0	0%	0	0%	0	0%
Total	44	22%	152	78%	196	100%

As can be seen from the data, the most common educational level for respondents overall was a Bachelor's / Honour's degree. All of the research participants had completed high school.

The survey also captured respondent age group information. This data is summarised in table 5-2 below.

Table 5-2 Age Group by Gender

Age group	Female		Male		Total	
	Count	%	Count	%	Count	%
<20	0	0%	0	0%	0	0%
21-30	9	5%	22	11%	31	16%
31-40	15	8%	66	34%	81	41%
41-50	14	7%	48	24%	62	32%
51-60	6	3%	16	8%	22	11%
>60	0	0%	0	0%	0	0%
Total	44	23%	152	77%	196	100%

As is evidenced from the table, the most common age group was between 31-40 years with the group 41-50 years being a close second.

5.2.2 Prevalence of Accidental Project Managers

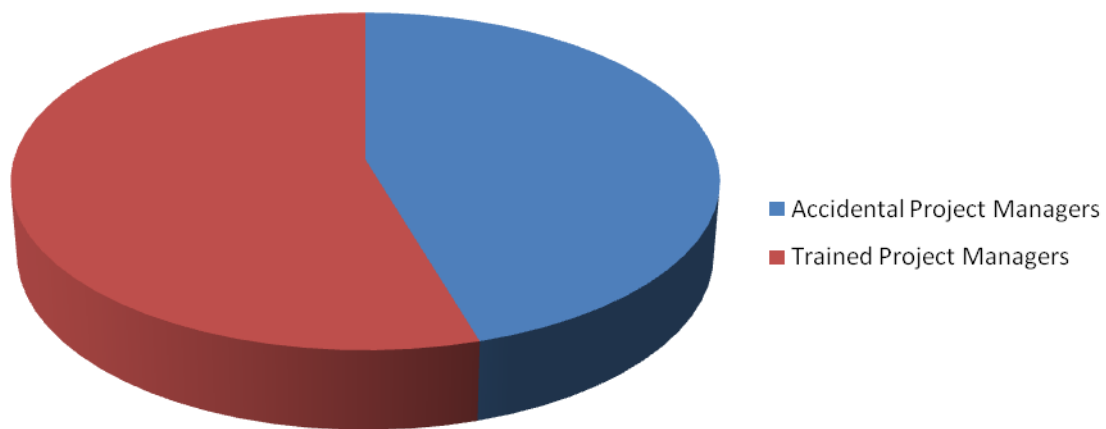
In order to answer the first research question, namely 'what is the prevalence of accidental project managers in the South African ICT industry', the training levels of respondents were examined. The professional background section of the questionnaire was used to determine whether or not a respondent should be classified as an accidental project manager. This classification was based on the answer to question 6, 'What is your level of formal project management training'. Respondents that selected the answer 'Never received project management training' were classified as accidental project managers. Respondents that selected any other answer were classified as trained project managers. Results indicated that, of the 196 respondents, 89 were accidental project managers and 107 were trained project managers. These results are detailed in table 5-3 below:

Table 5-3 Training Level by Gender

Training	Female		Male		Total	
	Count	%	Count	%	Count	%
<i>Accidental project managers</i>						
Never received training	19	10%	70	36%	89	45%
<i>Trained project managers</i>						
Received some training	17	9%	57	29%	74	38%
Certified in PM	8	4%	25	13%	33	17%
Total	44	23%	152	78%	196	100%

As can be seen from the results above, nearly half of respondents were accidental project managers and had not received any formal project management training. These proportions are graphically displayed in figure 5-1 below.

Figure 5-1 Prevalence of Accidental Project Managers



But what effect does this lack of training have on the outcome of projects? The answer to this question is examined in the remaining paragraphs.

5.2.3 Project performance results

The next section of the survey captured information relating to the projects managed by respondents. Following discussion with the pilot group it was decided to discard projects with a spend less than R50,000 or a duration under 2 months as their

significance was questionable. Of the 588 projects that were submitted by the respondents a total of 80 met these criteria and were filtered out of the results. Of the remaining 508 projects, 65 had answers of “I don’t know” against the questions relating to budget, time or operational system implementation. These projects were also discarded from the sample group due to incomplete information. The remaining sample size of 443 represented the list of projects that was analysed in the research study. Table 5-4 provides information on the project sizes that were reported in the survey.

Table 5-4 Project Size

	Count	%
<i>Project Spend</i>		
R50,000 – R1 million	352	79%
Greater than R1 million	91	21%
<i>Project duration</i>		
2 months to 1 year	359	77%
Greater than 1 year	84	17%
Total	443	

As can be seen from the data above, most projects were medium in size; spend was between R50,000 and R1 million, and duration was between 2 months and 1 year.

The final section of the survey captured performance information relating to project outcome. Each respondent was asked to rate the previous three projects that they had managed against three criteria: a) was the project within budget; b) was the project on time; and c) did the project result in an operational system? The results of these questions were totalled and the frequencies summarised in table 5-5.

Table 5-5 Project Outcome

	Yes		No	
	Count	%	Count	%
Within budget?	315	71%	128	29%
On time?	223	50%	220	50%
Operational system?	268	61%	175	39%

This information, along with the data on respondent training level, was used to answer the second research question pertaining to the effects of project manager training on project outcome. The analysis of each hypothesis using the survey data is detailed below.

Hypothesis 1

Hypothesis 1 analysed the effect of project manager training level on overall project outcome. The Standish definitions of project outcome were used to portray project results. If a project was considered to be delivered within budget, on time and resulted in an operational system it was considered to be a success; a total of 142 projects or 32% met this criteria. If a project did not result in an operational system, it was considered to be a failure; 175 projects or 40% were failures by this definition. A project was considered 'challenged' if it resulted in an operational system but failed to meet one or both of the time and budget criteria; 126 projects or 28% were challenged. Table 5-6 provides a summary of training levels against project outcome using the Standish group definitions.

Table 5-6 Project Manager Training Level and Project Outcome

Training level	Failed		Challenged		Successful		Total	
	Count	%	Count	%	Count	%	Count	%
<i>Accidental project managers</i>								
No training	96	49%	61	31%	38	19%	195	100%
<i>Trained project managers</i>								
Some training	60	37%	46	29%	55	34%	161	100%
Certified	19	22%	19	22%	49	56%	87	100%
Total	175		126		142		443	

As can be seen from the preceding data in table 5-6, there appears to be a clear relationship between a project manager's level of training and the outcome of the project being managed. Respondents without training had the greatest amount of project failures and challenged projects, and had the least amount of successful projects. Respondents with some training had better success, but still suffered from a significant amount of failed projects. The results clearly showed a significant difference for certified project managers who enjoyed a much higher success rate (56%), with only 21% project failures.

In order to statistically evaluate the relationship between the independent variable 'training level' and the dependent variable 'project outcome' the Pearson Chi Square method was employed using the SPSS statistical computer package. An alpha of 0.05 was chosen to determine the significance level. A chi square result of $p=0.02$ was obtained, resulting in the rejection of the null hypothesis that the two variables were unrelated and leading to the conclusion that there is an association between project manager training level and project outcome. In order to gain further insight into this relationship, the remaining three hypotheses examined in more detail the relationship between project manager training level and the three constructs that make up project outcome; budgetary, schedule and operational performance.

Hypothesis 2

Hypothesis 2 was tested to evaluate whether project manager's training levels have an impact on projects being completed within budget. Once again, the Pearson X^2 test was used to accept or reject the null hypothesis that training levels and budgetary performance were unrelated. The test results indicated that the null hypothesis should be rejected, and that there was indeed an association between the variables ($X^2 = 9.281$, $df=2$ and $p=0.01$) once again using an alpha of 0.05.

Table 5-7 Project Manager Training Level and Budget Performance

Within budget?	No training		Some training		Certified	
	Count	%	Count	%	Count	%
Within budget	125	64.10%	120	74.53%	70	80.46%
Over budget	70	35.90%	41	25.47%	17	19.54%
Total	195	100%	161	100%	87	100%

The data in table 5-7 supports this result, showing a significant increase in projects delivered within budget as the training level of respondents increased.

Hypothesis 3

Hypothesis 3 was used to test whether project manager training levels have an impact on projects being completed on time. The null hypothesis, that there was no association between training level and projects being completed within schedule, was rejected following a Pearson chi square test ($X^2 = 47.121$, $df=2$ and $P=0.00$) thus

implying that a correlation does exist between project manager training levels and projects being completed on time.

Table 5-8 Project Manager Training Level and 'On Time' Performance

On time?	No training		Some training		Certified	
	Count	%	Count	%	Count	%
On time	73	37%	79	49%	71	82%
Late	122	63%	82	51%	16	18%
Total	195	100%	161	100%	87	100%

The data in table 5-8 reaffirms this result, clearly demonstrating that the majority of projects managed by untrained project leaders suffer from being late. In contrast, certified project managers enjoy a success rate of 81% of projects being completed on time.

Hypothesis 4

Hypothesis 4 was evaluated to judge whether project manager training levels have an impact on IT projects resulting in an operational system, the third construct of the project outcome definition used in this study. Once again, a Pearson X^2 test rejected the null hypothesis of no association, with $X^2=19.417$, $df=2$ and $p=0.00$ using an alpha of 0.05. The results supported the conclusion that a positive association exists between project manager training level and a project concluding in an operational system.

Table 5-9 Project Manager Training Level and Operational System Outcome

Operational system?	No training		Some training		Certified	
	Count	%	Count	%	Count	%
Operational	99	50.77%	101	62.73%	68	78.16%
Non operational	96	49.23%	60	37.27%	19	21.84%
Total	195	100%	161	100%	87	100%

The results in table 5-9 support the statistical test data results. Although accidental project managers enjoy a greater success rate in this measurement than the on time metric, slightly less than half of all their projects fail to result in an operational system. Trained project managers enjoy a far greater success rate, with at least 63% of projects resulting in production systems.

5.3 Conclusion

This chapter portrayed the results of the research study in the context of the two research questions. Demographic information was displayed and proportionate data was given on respondent gender, age and education level.

The first research question investigating the prevalence of accidental project managers was answered by examining the training levels of the survey participants. The results indicated that 45% of respondents had not received any project management training and were regarded as accidental project managers.

The second research question pertaining to project outcome was answered through the formulation of four hypotheses. The Pearson chi square test was used to analyse the association between project manager training levels and each applicable variable, and a significance level of 0.05 was used to reject the null hypothesis. The first hypothesis described the association between a project manager's level of training and the overall outcome of her project as defined by the Standish group. The Pearson chi square test revealed that an association did exist between these variables. The second hypothesis proposed a relationship between training levels and a project being completed within budget. Once again, the statistical test results supported the rejection of the null hypothesis and led to the conclusion that an association exists between project manager training level and a project being completed within budget. The third hypothesis examined the association between a project manager's training level and the completion of projects on time; the Pearson chi square test confirmed that there was a correlation between these two variables. The final hypothesis analysed the relationship between a project manager's training level and the project resulting in an operational system. The chi-square test confirmed this relationship, and led to the conclusion that an association exists between a project manager's training level and a project concluding in a working system.

This chapter presented the results of the research study, and provided quantitative answers to the two research questions. The next chapter will investigate the impact of the results and provide more insight into the implications of the research findings.

Chapter 6 Discussion of Findings

6.1 Introduction

Chapter 5 provided details of the results of the research methodology described in the previous sections. A discussion and analysis of these results is presented in this chapter along with information on the limitations of the research report and recommendations for further study.

6.2 Discussion of results

The first research question examined the prevalence of accidental project managers in the ICT industry. These are project managers that have not received proper training and were selected based on previous technical expertise without any consideration for the behavioural and people skills required for effective project management (Graham and Englund, 2004). In order to identify these managers the research study focused on examining the training levels of project managers through the use of an online questionnaire. The results of the survey indicated that, of the 196 people that completed the survey, 89 of respondents, or 45%, were untrained in project management techniques and would be termed 'accidental project managers' under the above definition. These figures are consistent with findings across the project management literature. According to a survey conducted by the Meta Group on IT project management training levels, 75% of senior managers indicated that a lack of project management skills was a significant challenge in delivering IT projects, and very few companies investigated indicated that they undertook project management training initiatives (Hoffman, 2003).

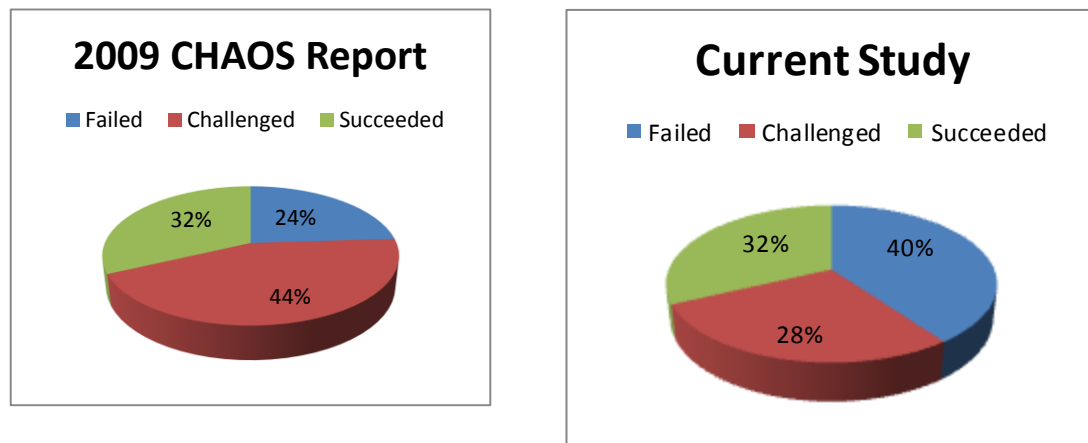
In order to gain further insight into the risk levels and opportunity cost of failing to provide adequate training to project managers, a second research question was formulated to examine in more detail the effect of training levels on project outcome using four hypotheses that tested variables relating to project success. The first hypothesis used the Standish Group's definition of project performance to classify three possible project outcomes:

- a) Failed. The project was abandoned and did not result in an operational system.
- b) Challenged. The project failed to meet budgetary or time goals, but still resulted in a working system.
- c) Succeeded. The project met budgetary and time goals, and also delivered a fully working system that provided the expected value.

The Pearson Chi Square was used to determine if there was an association between the training level of the project manager and the outcome of the project she managed. The result of the test indicated that the null hypothesis was rejected and that there was indeed a correlation between the outcome of a project and the project leader's level of training.

Applying the Standish Group's definitions to the research report, the questionnaire results indicated that a total of 40% of the 443 reported projects failed, 28% were challenged, and 32% were successful. To place these figures in perspective, figure 6-1 benchmarks the research results against the 2004 Standish Group's CHAOS report.

Figure 6-1 Project Outcome Comparison



Adapted from: (Standish Newsroom, 2009)

As can be seen from the comparison above, projects analysed in the research report enjoyed the same success rate as the 2009 CHAOS report results, but suffered from nearly double the failure rate. Overall, this would indicate far poorer project

performance for South African ICT managers when benchmarked against the Standish Group's report.

In order to examine the correlation between project outcome and training level in more detail, the remaining three hypotheses tested individually the budget, schedule and operational system constructs that make up the Standish Group's project outcome definition against project manager training levels. Overall, being within budget was the most commonly achieved performance metric, while completing projects late was the biggest deterrent to project success. One possible reason behind this schedule metric suffering from poor performance may be that respondents regarded incomplete projects (those that did not result in an operational system) as also being late (as the project schedule was never attained). By the same logic, respondents that reported projects that failed to achieve a working system may have also regarded them as being within budget if the project was abandoned before the budget was close to being spent. Future research could be undertaken to evaluate the cause-and-effect relationship between project outcome and budget or time performance.

The results indicated that accidental project managers without any training exhibited the poorest performance scores with the highest number budgetary, schedule and scope achievement failures, and the lowest number of successful projects.

Conversely, certified project managers scored the highest across each of the three measurements of project outcome. An examination of the three hypotheses using a similar Chi Square test to the first hypothesis indicated that performance in each of the three constructs was positively associated with the training level of the project manager.

The implications of the study results are significant for the South African IT industry. Numerous international studies have concluded that a project manager's training level has a significant and beneficial impact on project outcome (Brown, 2001; Zielinski, 2005; Hoffman, 2003). This research confirms these conclusions in the South African context. In every aspect of project performance be it budget, schedule or scope, training was identified as a critical ingredient to project success. Taken in conjunction with the survey results which indicated that nearly half of the respondents were untrained IT project managers, this study highlights the alarmingly high risk

level of project failure in the South African ICT industry and the cost associated with that failure. In the Standish Group's CHAOS report conducted on projects in the United States it was found that of the \$255 billion spent on IT projects, over \$55 billion or 22% was lost due to project failure and budget overruns (Softwaremag.Com, 2004) . Given the comparatively higher failure rates for local IT projects, this implies that a lack of training in project leaders is resulting in a significant amount of lost revenue due to failed projects. To gain an understanding of the cost of project failure in a South African context, table 6-1 displays data from the survey detailing project manager training levels for large spend projects (greater than R1 million).

Table 6-1 Training Level for Projects Greater Than R1 million

Training	Projects greater than R1 million	
	Count	%
<i>Accidental project managers</i>		
Never received training	40	9%
<i>Trained project managers</i>		
Received some training	23	5%
Certified in PM	28	6%
Total	91	20%

As can be seen from above, slightly less than half of large spend projects reported in the survey were managed by untrained project managers. According to the survey results on project performance in chapter 5, these untrained managers have only a 19.49% chance of leading successful projects. These figures represent a significant exposure to potential losses arising from the activities of untrained project managers. Thus an important result from this study is to highlight the opportunity cost for organisations that fail to invest in adequate training for project managers. As discussed in Chapter 2, the number of complex, large scale IT projects in the South African ICT industry is likely to increase. This growth in project demand will compound the exposure to project failure and make realising the benefits of project success even more important for local organisations.

6.3 Recommendations for future research

This study focused on training-to-performance correlations for effective project managers in order to highlight the danger of promoting accidental project managers without proper attention to their academic development and certification. However, another key consideration in the accidental project manager debate is the need to identify the proper soft skills when selecting project managers (Graham and Englund, 2004). Further studies could be undertaken in the South Africa context that seek to identify which behavioural skill sets are desirable in project managers using psychometric and personality tests. Furthermore, methods need to be researched that enable organisations to identify these desired skills in project-focused individuals. Although such studies and tests have been conducted in the international arena, particularly in the United States (largely bolstered by the presence of the Project Management Institute) very little research has been performed in the South African environment. The local industry has its own challenges fuelled by the workforce's cultural diversity and South Africa's distinctive business environment. These local factors need to be identified, and the optimal methods for project manager selection need to be employed to allow organisations to best take advantage of South Africa's unique opportunities (Wyk and Custy, 2004). An extension of this research could be to investigate in detail effective criteria for aligning the correct project managers to the right projects based on required personality attributes and hard and soft skills.

One of the limitations of this study was the omission of any attempt to validate project performance ratings. It is likely that many untrained project managers by their very definition would have failed to employ best practice project planning techniques such as obtaining a formal budget, documenting project specifications and establishing a project timeline. It is also likely that many accidental project managers would have failed to conduct adequate post-project reviews to evaluate whether all stakeholders requirements had been met when determining if the project results in an operational system. The absence of these tools would make any measures of success against the three criteria extremely subjective. Therefore a recommendation for future research would be to conduct a similar study but expand on the results to gain more insight into each project manager's rating of success. An enhanced study featuring a

more in-depth questionnaire, or perhaps a structured interview, examining the use of formal project tools and cross-referencing these against project manager's self-rated results, could be used to evaluate participant objectivity. Furthermore, a 360 degree view of success criteria would further improve the accuracy of this rating and could be obtained by extending the respondents to other stakeholders in the project process such as the project manager's superiors and subordinates and, critically, end users of the project in question.

A further limitation identified in the first chapter is the choice of sampling method used in this report. A convenience sample was chosen due to practical obstacles. A future study could utilise the same methods described in this research on a more focused sample group, perhaps by increasing the level of engagement of the Project Management Institute of South Africa.

The study did not incorporate the timing of projects against training; a certified project manager may not have been trained when managing all three projects. The identification of training level against project outcome is critical to the analysis performed in this report. A further longitudinal study may be undertaken to examine project manager training levels for specific projects per respondent.

Finally, the study only used three rather broad categories to measure project spend, as this was not the focus of the research. Of these categories, only two were used to analyse the questionnaire results; projects with a budget between R50,000 and R1 million, and projects with a spend greater than R1 million. It would be interesting to conduct a spin off study to accurately measure and compare the exact spend, both expected and actual, against project manager training levels. These results could then be cross referenced against the average failure rates of projects as indicated in this study and an expected value calculated to gain more precise insight into the cost of promoting untrained project managers to lead projects. This financial focus will be valuable in motivating local companies to enhance their project training initiatives.

6.4 Conclusion

IT projects continue to fail at an alarming rate, with less than 20% of large projects completed successfully (Perkins, 2007). The majority of IT initiatives have a far

reaching impact within organisations due to the integrative nature of IT systems. As a result, projects are often large in scope and their subsequent failure can be costly to the enterprise. In today's fast moving global business world, IT projects are critical to achieving competitive advantage by allowing businesses to adapt to changing conditions while optimising supply chains. As a result, the opportunity cost of failed IT projects can place companies at a significant disadvantage in the business world. One of the primary factors behind this failure is the placement of under qualified technical personnel at the head of IT projects because executives do not understand the extent of training required to develop effective project managers. It is critical that senior management acknowledge the separate career path of project management, and treat it like any other specialised professional and afford it the appropriate training resources (Brown, 2001).

This study attempted to gain a better understanding into the prevalence of these untrained accidental project managers in the local IT industry, and to examine the effects that project management training (or lack thereof) has on project outcome. In order to facilitate this analysis, a questionnaire was administered to IT project managers through the Internet Service Provider's Association and the Project Management Institute of South Africa that examined levels of training against project results in the form of budget, schedule and scope and used a quantitative, descriptive methodology to collate the results. The results of the research indicated that a significant proportion of South Africa's IT project leaders have little or no formal project management training. Furthermore, the study concluded that this lack of training is a significant factor in the poor performance of IT projects, leading to budgetary, schedule and quality problems. It is hoped that by highlighting the opportunity cost of failing to provide adequate training to project leaders, organisations will realise the benefit of focusing resources on project management training and therefore reduce the number and cost of IT project failures in the South African ICT environment.

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Appendix 1 – Covering letter to the ISPA mailing list

Dear sir / madam

I am currently conducting research for my Master's dissertation aimed at evaluating project management skill sets in the South African ICT sector. In order to complete this research I require feedback from project managers in the ICT industry. To this end I have created a short, anonymous online questionnaire. *If you are a project manager in the ICT industry* please can you complete this questionnaire by following the link below. It should not take more than 5 minutes to complete.

<http://www.surveygizmo.com/s/162575/project-management>

Please circulate this email to as many of your colleagues as possible in order to assist in guaranteeing a good response rate.

This research will help to further the development of project management in South Africa. Thank you for your assistance in this regard.

Kind regards

Matthew Green

matthew@allgreenteam.com

Appendix 2 – Response from the ISPA

We have a couple of options:

- We can use the adverts@ispa.org.za list to send a request out to ISPA's members to participate. That list requires no up-front approval, but the response rate is a bit lower than the main ISPA discussion list.*
- We can also use the ispa@ispa.org.za list to send out a request for participation, in which case, I'll need to run the text past Mancom first, which should be a formality.*

There's a Mancom meeting a week from today, which would be a good time to run a message past them if you'd like it to be posted to the main ISPA list.

Warm regards,

Ant Brooks

ISPA General Manager

Appendix 3 – Article submitted for publication by the PMISA

The term 'accidental project manager' has been coined to describe the phenomenon whereby technical specialists are promoted to project management positions based solely upon technical expertise in the area of the project under consideration or because of previous outstanding performance without consideration for the correct project management attributes and skill sets. The position of project manager is frequently regarded as the natural career progression for technical experts in many project-focused organisations that do not accommodate for dual career paths for professional development. This common practice of creating project managers based on past performance and technical expertise and ignoring requirements relating to important project management attributes and leadership skills is a major cause for IT project failure.

The South African ICT sector is undergoing several changes that are resulting in a rapidly increasing demand for effective project managers. This environment is resulting in the accelerated development of project managers and with it the threat of increasingly large numbers of inadequately trained accidental project managers in the local industry. This study will examine the prevalence of accidental project managers in the South African ICT industry, and their impact on project outcomes.

In order to facilitate this research I require an audit of current project management training levels present in the South African ICT sector. To this end I have created a short, anonymous online questionnaire. *If you are a project manager in the ICT industry* please can you complete this questionnaire by following the link below. It should not require more than 5 minutes of your time.

<http://www.surveygizmo.com/s/162575/project-management>

Please forward this link to any of your colleagues that currently practice project management in the South African ICT industry in order to assist in guaranteeing a good response rate.

This research will help to further the development of project management in South Africa.

Kind regards,

Matthew Green

matthew@allgreenteam.com

Appendix 4 – Response from the PMISA

Dear Matthew

Thank you for your email.

We can assist you as follows:

Include a summary of the research objective and a URL for the online questionnaire in the next edition of ProjectNet magazine

Include a news item on the PMSA homepage with a link to the questionnaire.

Include the above in an edition of the PMSA electronic newsletter.

We will be very interested in the results. you may also wish to present a paper on these results at the PMSA Western Cape conference in November, or at the National conference in September 2010.

Kind regards

Taryn

Taryn van Olden (ABC)
Chief Executive Officer

Project Management South Africa (PMSA)

Tel: 011 257-8072

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Cell: 082 779-1314

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Website: <http://www.pmisa.org.za>

PMSA is the representative Professional Body for Project Management in South Africa that enables Development and Recognition of World Class Project Practitioners.

From: Matthew Green [mailto:matthew@allgreenteam.com]

To: ceo@projectmanagement.org.za; admin@projectmanagement.org.za; info@pmisa.co.za

Subject: Project management research for MBA thesis

Dear sir / madam

I am currently completing a dissertation for my MBL on the subject of project management in the South African ITC industry. As part of my research, I have a short on-line questionnaire that I wish to send out to members of the PMISA.

Is this something that you would be able to assist with? The research results may also be useful to the PMISA, and I am happy to supply them and comply with any rules you may have.

Thanks in advance,

Regards

Matthew Green

Appendix 5 - Online questionnaire

Project Management Questionnaire

Please only complete this survey if you are a project manager in the South African ICT industry

Section 1 - General background

1. What is your gender? *

☐ Male ☐ Female

2. What is your age group? *

☐ <20 ☐ 21-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ >60

3. What is the highest level of education you have completed? *

-- Please Select --

Section 2 - Professional background

4. Which function best describes your current role? *

-- Please Select --

5. In which industry do you work? *

-- Please Select --

6. What is your level of formal project management training? *

-- Please Select --

Section 3: Project performance

This final section concentrates on project outcome. Please think about the last three completed or abandoned IT projects that you **managed** and answer the questions below.

Project 1:

7. What was the final spend on the project?*

☐ less than R50 000 ☐ R 50 000 - R1 million ☐ Greater than R1 million

8. What was the total duration of the project?*

☐ less than 2 months ☐ between 2 months and 1 year ☐ greater than 1 year

9. Please rate the outcome of the project:*

	Yes	No	Don't know
Was the project delivered within budget?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was the project delivered on time?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did the project result in an operational system?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Project 2:

10. What was the final spend on the project?*

☐ less than R50 000 ☐ R 50 000 - R1 million ☐ Greater than R1 million

11. What was the total duration of the project?*

- ☐ less than 2 months ☐ between 2 months and 1 year ☐ greater than 1 year

12. Please rate the outcome of the project:*

	Yes	No	Don't know
Was the project delivered within budget?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was the project delivered on time?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did the project result in an operational system?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Project 3:

13. What was the final spend on the project?*

- ☐ less than R50 000 ☐ R 50 000 - R1 million ☐ Greater than R1 million

14. What was the total duration of the project?*

- ☐ less than 2 months ☐ between 2 months and 1 year ☐ greater than 1 year

15. Please rate the outcome of the project:*

	Yes	No	Don't know
Was the project delivered within budget?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was the project delivered on time?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Yes	No	Don't know
Did the project result in an operational system?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Finished? [Submit your Survey](#)

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